

PURCHASING

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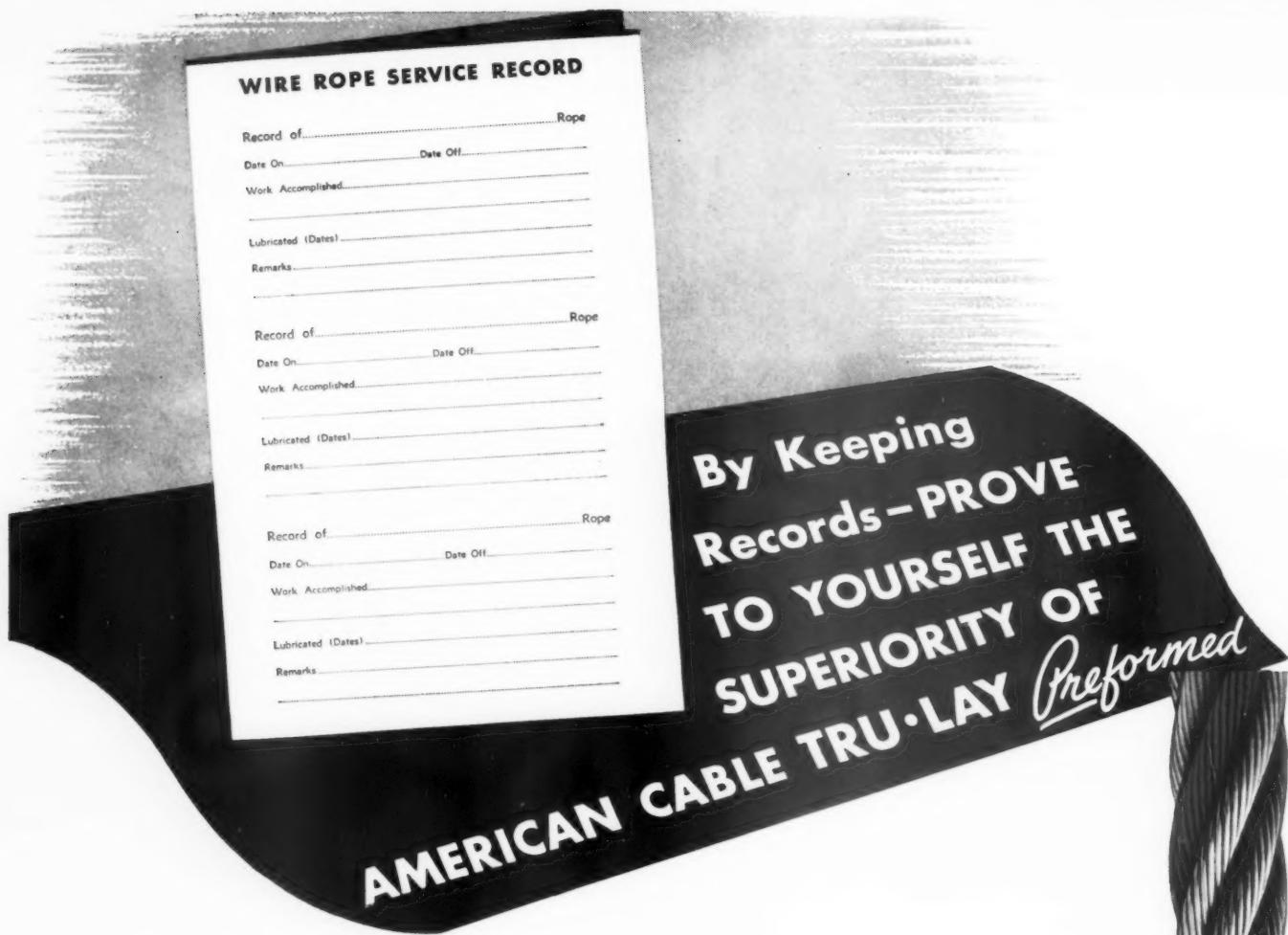
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DEFENSE BUYING PROGRAM SHOWS ITS TEETH

ONE of the outstanding accomplishments of the National Defense Advisory Commission has been the maintenance of a relatively stable price structure despite sharply increased demand and the insistence on faster than normal production and deliveries. All the elements of a sellers' market are present in an exaggerated degree. Yet with an increase of 22% in industrial production over the past seven months, the price index has advanced less than 2%.

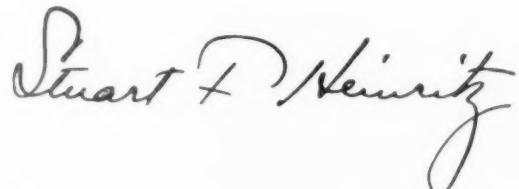
That record has been made possible by two factors. One of these is the whole-hearted cooperation of industry, which has freely recognized the compensating advantages of quantity production rather than looking only at the urgency of demand. The other factor is the detailed, exhaustive, and accurate information in the files of Leon Henderson, Commissioner in charge of price stabilization. This situation and emergency is being considered in the light of more current factual data than has ever before been available. And facts are necessarily the basis for policy and action.

Mr. Henderson's statement before the Lumber and Timber Products Defense Committee last month was a reminder that still a third factor can be called on—the "draft industry" provisions of the Selective Service Act, which would put some very sharp and powerful teeth into the defense procurement program if they were invoked. In regard to business generally, the Commissioner has shown no disposition to call upon these extraordinary powers, but price advances ranging up to 52% in extreme cases have moved him to remind industry that these "teeth" do exist.

When Mr. Henderson announced his determination to "get a full supply (of lumber) on time and at fair prices," his statement implied the ability of the industry to meet these conditions, and, as an alternative, the ability of the government to enforce compliance by price control or by conscription of supplies. To avoid the latter course it will be necessary first to prove that his facts are wrong.

There is another part of his statement that deserves attention, and commendation. Mr. Henderson declared that it was not only important that the government get lumber, but that civilian requirements also should be met. "As far as I am concerned," he said, "if we have a lower price for Government purchases than for other activities, I'm going to make another series of recommendations."

Purchasing agents in particular will be heartened by this statement of policy. They are deeply concerned with prices, they oppose discriminatory price policies, and looking ahead, they know that effective stabilization now will relieve them of one of the greatest hazards of this war of materials.



"Cracker Barrel Steel" is Gone!



BACK IN THE "GOOD OLD DAYS" crackers came in barrels; and many people bought steel, too, with no clear idea of what it was, or how it was made.

Methods of storing and handling were "hit and miss"; results to be expected were uncertain! Crackers were crackers; steel was steel!

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HOW



BUYS

By
HOWARD G. GOLEM
and
CHARLES T. LEIGH



TO BUILD airplanes it is necessary that there be a purchasing organization to buy many things—machinery, tools, supplies, raw materials, parts—little things like toothpicks and big items like hydraulic presses. Some are seemingly insignificant; however, a close scrutiny proves them quite vital indeed.

The importance of this function of procurement at the Consolidated Aircraft Corporation, San Diego, California, is evidenced by the fact that the purchasing executive is a vice president of the corporation. While he signs the purchase orders under the title of "Purchasing Agent," his position in the organization is more accurately described on the roster of executives as "Material Supervisor," a title which reflects the broader scope of responsibility in this department.

Purchase for Specific Use

Policies of buying vary to suit the character of an industry or agency. Some companies buy primarily on market conditions, or on a speculative basis. Consolidated Aircraft's policy might better be defined as purchase by contract for delivery against scheduled production.

While certain standard items are ordered on minimum and maximum perpetual inventory control cards, the major portion of materials and parts are requisitioned for purchase based on release prepared by the engineering department for specified contracts and models of airplanes. This engineering release of types and quantities per ship is, at the beginning of a contract, in the nature of a pre-release which is estimated as closely as possible to permit the speedy purchase of basic items for production.

As the detailed design progresses, each part is checked and necessary revisions are made to increase, decrease, or cancel the pre-released materials which have been ordered. While such changes are sometimes costly, and scrap is grudgingly accumulated, no better method appears available which would not delay starting production. Standardization, large volume, and "freezing the design" will probably be the answer to better economy in this respect.

Engineering releases are segregated and accumulated by the material order group, where

requisitions to purchase (Figure 1) are prepared for the buyers. A requisition control record (Figure 2) keeps track of materials so ordered. This group, since their function is vital to the production department, as well as purchasing, coordinate with the scheduling department, engineering, and the shop. The quantity to buy is based upon inventory, contingency for spoilage, number of airplanes and spare parts to build, and purchasing policy. Needless to say, accuracy, knowledge of material specifications and uses of the item are important to assure sufficient quantity so that production is not hampered, with resultant delay and excessive cost.

Buying Organization

Because of the multitude of items to buy, most of which require a considerable knowledge of source, quality, service and price, it has proved the best policy to assign certain classes of materials or parts to each of several buyers. The buyers operate under the guidance of the Material Supervisor, and are aided in the preparation of necessary detail by assistants who are learning the mechanics and principles of purchasing.

Orders are sometimes placed on catalog information and price lists published by reputable firms. This policy is particularly true where items are of a standard nature and repetition of the requirement frequently occurs. The majority of the factory supply items are handled in this manner, while the greater percentage of production materials and parts are purchased on bids.

Unless the item to be purchased is of a highly specialized nature with a restricted source, letters of inquiry containing quantities, specifications, scheduled requirements, and blueprints when appropriate, are sent to three and sometimes four sources. When quotations are received, they are carefully analyzed and purchase order contracts are awarded to the successful bidder. Price alone does not determine the successful bidder, as other factors, such as quality, delivery, dependability and past performance are considered.

The principles and ethics of purchasing constitutes a broad subject. Consolidated Aircraft attempts to treat all vendors with fairness, and expects the same in return. It is felt that this has developed the



CHARLES LEIGH



HOWARD GOLEM

CHARLES THOMPSON LEIGH, Vice President and Material Supervisor, is a Nebraskan by birth, took his mechanical engineering degree at the Worcester (Mass.) Polytechnic Institute, and spent fifteen years at civil and mechanical engineering work in the Northwest before coming with Consolidated in 1926. Included in his record is a period of two years as chief engineer of the Raymond (Wash.) Unit of the Airplane Spruce Division during the first World War. His first assignment with Consolidated was the construction of additional factory space. From that job he advanced steadily to his present position in charge of materials.

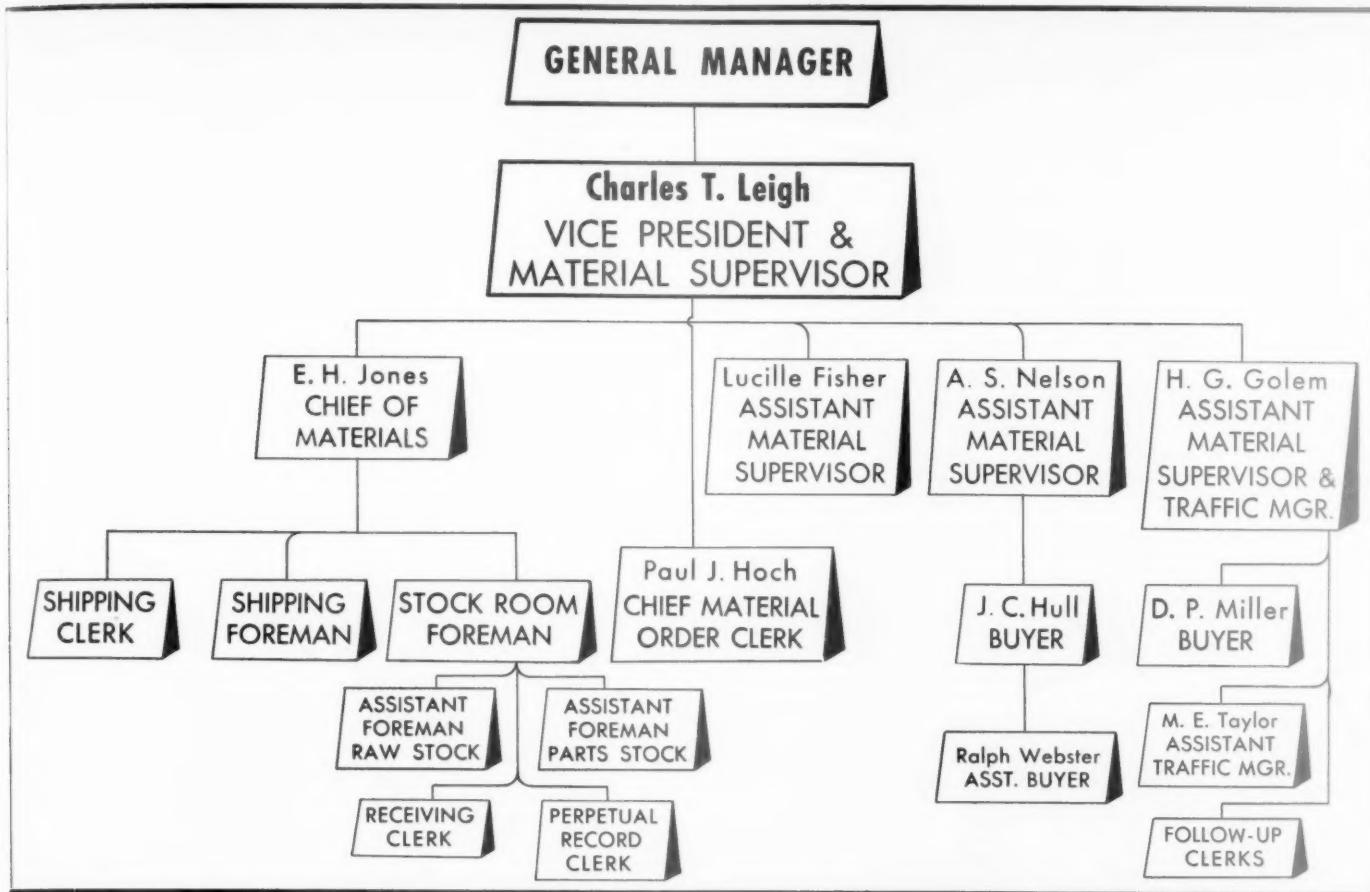
HOWARD G. GOLEM, Assistant Material Supervisor and Traffic Manager, has been with Consolidated since 1932, but prior to that time was a production clerk at the Tonawanda (N. Y.) Products Company, making parts for Consolidated. He is a graduate in industrial management, University of Buffalo; in banking and finance, American Institute of Banking; in accounting and traffic management, La Salle Extension University. He has had practical shop and accounting experience with the Buffalo Bolt Co., Central Branch State Trust Co., North Tonawanda, and the Chevrolet Motor Co. Director of the

Transportation Club of San Diego, and member of the Chamber of Commerce Shippers' Committee.

ALBIN S. NELSON, Assistant Material Supervisor, came to this country from Sweden at the age of two, worked his way through high school, and added University Extension training. He was employed on an engineering survey of new roads for Minnesota prior to joining the Consolidated organization in 1935 in the materials department.

MISS LUCILLE E. FISHER, Assistant Material Supervisor, is a native of Buffalo and graduate of Hutchinson Central High School. She was employed by Consolidated in 1925 as a stenographer, and rapidly advanced to a position of greater responsibility.

PAUL JOSEPH HOCH, Chief Material Order Clerk, is a graduate of Buffalo Technical High School, and worked for ten years with the D. H. Stoll Company and the Peck Stow & Wilcox Company of Buffalo before joining Consolidated in the assembly department in 1927. From that position he worked up to his present responsibility as head of the Material Order Group.



ALBIN NELSON



LUCILLE FISHER



PAUL HOCH



EDWARD JONES

EDWARD H. JONES, Chief of Materials, spent two years in automotive stock work after his graduation from high school in Buffalo, entered the aviation field with the General Aircraft Corporation in 1928, and a year later became a stock room clerk for Consolidated, subsequently advancing to his present position.

J. C. HULL, Buyer, is a native of Illinois, college trained in mechanical engineering. He started in the raw stores department of the Douglas Aircraft Company, and came with Consolidated in 1935, when the San Diego plant was opened. He became assistant foreman of the raw stores department, was transferred to the purchasing department as assistant buyer, and later promoted to buyer.

D. P. MILLER, Buyer, is a native of New York City and received his technical training at the University of Rochester. Following plant experience with the Fiberboard Products Company, Los Angeles, he came with Consolidated in 1936 as clerk in charge of production control in the machine shop department. Transferred to the purchasing department in 1939 as Outside Production Buyer.

RALPH WEBSTER, Assistant Buyer, acquired his first purchasing experience as a merchandise buyer in a Philadelphia hardware concern. He has also been associated with steel construction work, and in the credit division of the Star & Crescent Oil Company. Joined the Consolidated organization in 1940.

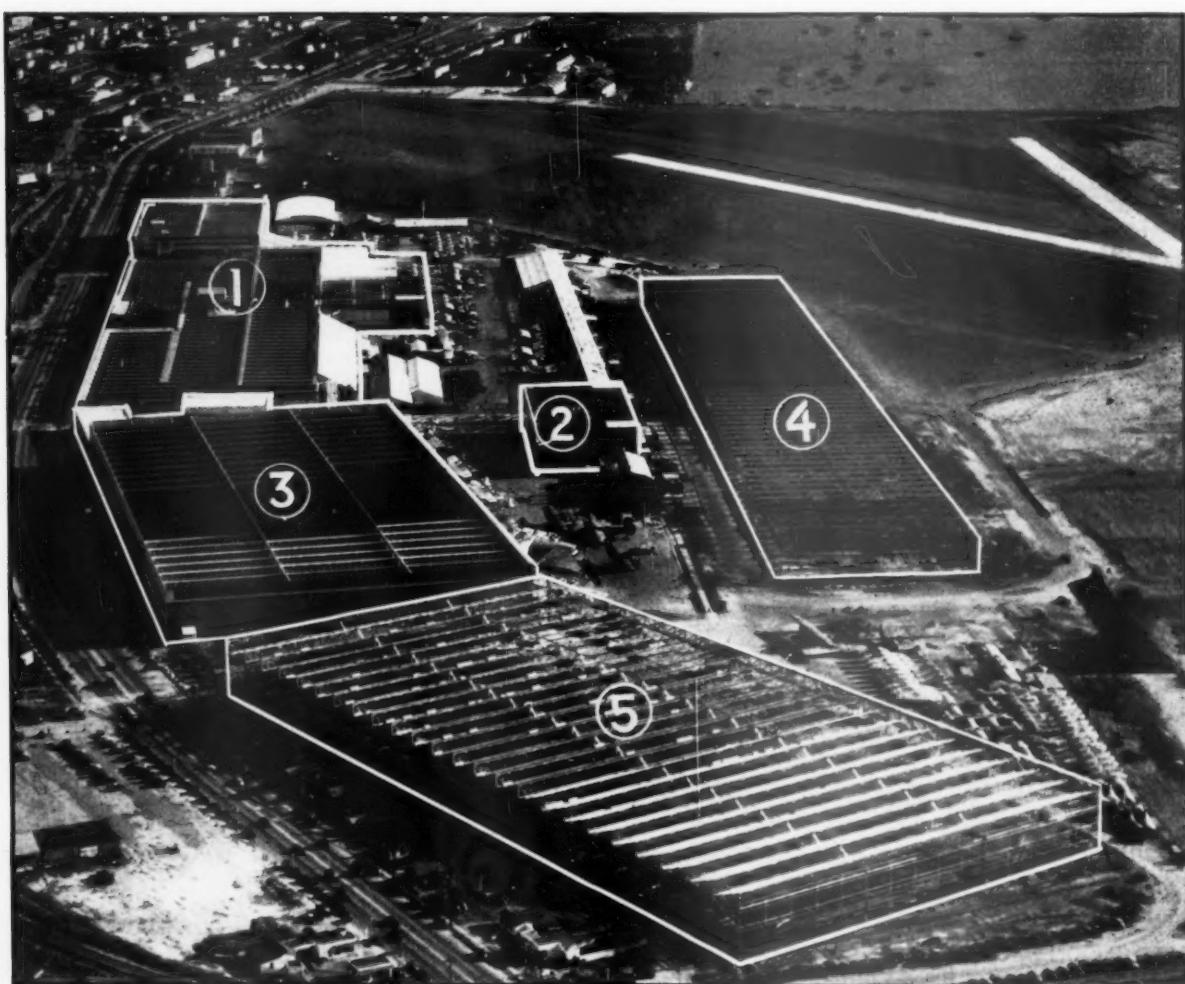
MILTON E. TAYLOR, Assistant Traffic Manager, received his engineering training at Genesee Wesleyan Seminary, and advanced accounting at the University of Buffalo. Prior to joining Consolidated in 1928, he served as accountant and parts manager for Charles D. Taylor, Lockport, N. Y., Charles W. Beers Co., and the McConnell Chevrolet Co. His record with Consolidated is unique in that he has worked in every branch of the company except inspection—including stock room work, engineering, assistant to the superintendent, planning, etc., and about four years in an administrative capacity. When the company moved to San Diego in 1935, he was assigned to the purchasing department, and was appointed Assistant Traffic Manager the following year. He holds a student pilot's license and has done considerable flying. He also has a number of inventions to his credit, including a patent for a storage battery.

vendors' confidence in our integrity, which has been reflected in better prices, assured quality, and satisfactory delivery to meet the urgent requirement of advanced production schedules.

Much of the buyers' time is devoted to interviewing representatives of the many vendors and prospective suppliers. While the time for each necessarily must be limited so that all may have a fair chance to present their product, an alert buyer can obtain from these contacts much beneficial knowledge which would otherwise require hours of research. In this respect it is our policy to accept reputable vendors' statements of the value of their products without subjecting innumerable items to our own tests. However, items in a development stage, particularly those of a rather

complex nature, must be tested and proven. In this connection the buyers contact the group leaders of the engineering department through the Standards Engineer, who coordinates outside technical problems with the shop and engineering departments.

Development of sources of supply is of utmost importance in this era of rapid expansion of aircraft production, and the burden of procurement of sub-contract items rests heavily upon the buyer. Not only must he have a working knowledge of the many laws such as the Vinson-Trammel Act, the Robinson-Patman Bill, Walsh-Healey Act, Fair Labor Standards Act, and many others, but he must also be familiar with financial procedure, contractual requirements determining the responsibilities of the parties. Further, he must



A GRAPHIC PICTURE OF PHENOMENAL PLANT EXPANSION

Adjoining Lindbergh Field, in San Diego, is the main plant of the Consolidated Aircraft Corporation. The original plant (1), constructed in 1935, is shown at the upper left. On Labor Day, 1940, the company dedicated (2) its new Final Finish Building for painting, etc., and (3) a Final Assembly Building 360 x 720 feet in size. In January, 1941, a Small Parts Assembly Building (4) was completed 200 x 1500 feet; also another Final Assembly Building (5) duplicating the one which was put into service only four months previously. Within five years, the manufacturing area was increased by approximately 10 times. About 30% of production activi-

ties can be conducted on the paved yard areas. Now under construction and scheduled to be in complete operation by June, 1941, is a huge Parts Plant on a 52-acre site a mile and a half north of the Lindbergh Field plant, with an adjacent parking area of 72 acres. The new plant will double present capacity, with a group of eight buildings, a total roofed area of 1,553,000 square feet, plus loading platforms of 64,000 square feet. The oldest factory building is less than 5½ years old. At the new plant, all yard areas will be paved and the spur sidings will be of the depressed track type for quick car-floor-level loading and unloading.

PART NO. OR LINE		MIN.		PRICE		CARD NO.							
DESCRIPTION		SPEC.											
CHG	CITY	MODEL	MODELS	MODEL	MODEL	MODEL	MISC.	ON HAND	ORDER	SURPLUS	REQ NO.	DATE	REMARKS
REJECTIONS													
DATE	X R	PCS	DATE	X R	PCS								
2													

CONSOLIDATED AIRCRAFT CORPORATION SAN DIEGO, CALIFORNIA		PURCHASE ORDER		Nº 33709 C	
		TO		U. S. ARMY CONTRACT NO.	
				DATE	
				PURCHASE NO.	
				ITEM NO.	
ALL MATERIALS TO BE DELIVERED F. O. B.		SHIP TO		NAME AND DESCRIPTION OF ARTICLE	
CONSOLIDATED AIRCRAFT CORPORATION SAN DIEGO, CALIFORNIA				UNIT PRICE	TOTAL PRICE
ITEM NO.		QUANTITY	DESCRIPTION		
A					
VENDORS COPY					
3					

ORIGINAL CONSOLIDATED AIRCRAFT CORPORATION SAN DIEGO		PURCHASE ORDER REQUISITION		A Nº 22683	
DATE TO PURCHASING AGENT PLS. USE THE FOLLOWING:		PURCHASE ORDER NO.		PURCHASE ORDER NO.	
FROM		SHIP TO		SHIP TO	
DELIVERY DATE		UNIT PRICE		TOTAL PRICE	
QUANTITY		DESCRIPTION OF MATERIAL			
1					
INSPECTION AT		F. O. B.		TERMS	
APPROVED		SIGNED			

Fig. 2. The requisition control card assures adequate and balanced supplies of material for scheduled production.

educate the sub-contractor in the processes, practice, and procedure of manufacturing aircraft parts.

Inability to purchase and obtain rapid delivery of necessary machinery and equipment, together with the time necessary to erect buildings, has thrust upon the purchasing personnel a problem of parts procurement which a short time ago was of minor consequence, since the industry was, generally speaking, self-contained in this respect.

The Purchase Order

As many items of similar nature as possible are incorporated on the same purchase order (Figure 3). This is a 10-part form. The original and acknowledgment copy are mailed to the vendor. The other copies are circulated to various departments affected by the information thereon and receipt of the materials purchased. The order specifies quantities, descriptive data, applicable specification (Army, Navy or Commercial), schedules of delivery, prices, shipping instructions, point of inspection, and other contractual information.

One copy of the purchase order is sent to the perpetual inventory record group of the purchasing department, and the pertinent information is recorded. This material record (Figure 4) is essentially the working point for various departments functioning in connection with stock, purchasing, cost, material requirements, and production. Requisitions prepared by the planning requisition clerks for the withdrawal of material from the stockroom (Figure 5) are recorded on these cards, and it is always possible to determine

Fig. 1. The purchase order requisition originates in the material order group, based on the engineering releases for specified contracts and models.

Fig. 2. These are ten copies of the purchase order, routed to the vendor, purchase records, follow-up, accounting, receiving, and inspection division.

the amount of parts or material available for current contracts or as surplus. A physical check is constantly being made of the actual inventory, so that it is certain the records are accurate. Requisitions for stock are priced from this record, and the material cost of a contract is determined essentially from this information.

A copy of the purchase order is forwarded to the receiving department, one to the receiving inspection department, and one or more to the inspectors. One copy goes to the accounting department, this being ruled on the back to provide a record of invoices and commitments.

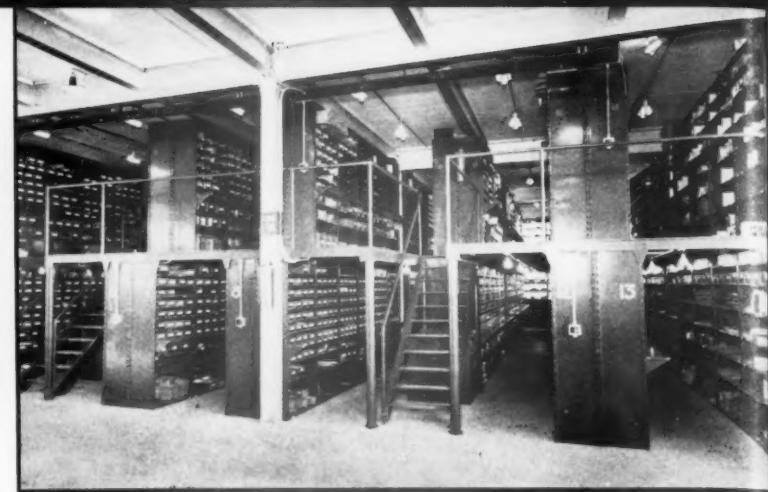
Upon receipt of the materials, the receiving clerk checks the item against the order and receiving reports (Figure 6) are prepared accordingly. Copies of these receiving reports are sent to the receiving inspection division, where the parts are checked to determine that they are in accordance with the specifications and dimensions under which they were purchased. Copy of the receiving report is immediately relayed to the follow-up department for their information, and another copy is filed with the accounting department, so that settlement can be made on vendors' invoices. The invoices are checked in the purchasing department.

Rigid Inspection

In this outline of procedure, frequent mention has been made of inspection—a reflection of the vital requirement of quality in all materials used, particularly essential in airplane manufacture to insure a thoroughly dependable and mechanically perfect product.



A view of the raw parts stores, in the section devoted to extruded bars.



The finished parts stockroom in final assembly building No. 1.

It will be noted that the purchase order itself carries the specific notation, alongside the Purchasing Agent's signature, that all materials are subject to inspection at a stated point. The same requirement appears on the purchase order requisition. The requisition control card has a block for recording rejections of purchased material, in order that quantities can be reconciled with the actual production requirement. The receiving report has two columns for the quantity rejected and a reference to the applicable rejection report.

The rejection report (Figure 7), made out by the inspectors, is a four-part form, with one copy for purchasing, a duplicate for the production department, and one for the inspection files. The fourth copy, for the vendor, is printed on a heavy pink card, punched so that it can be directly attached to the rejected material, affording a positive identification of the unsatisfactory material together with the cause for rejection.

The rejection of material or parts received, which do not comply with the specification, is handled through the purchasing office. This seems to be the logical place for this activity since it is important that the buyers be informed of the quality of materials which they purchase. The majority of rejections are handled by one individual; however, each is coordinated with the respective buyer. In this respect it is necessary that the purchasing office work very closely with the inspection department, which functions under the jurisdiction of the Works Manager. Coordination of inspection activity with the purchasing office eliminates unwarranted rejections against vendors.

Stores and Follow-Up

After parts and materials are accepted by inspection, they are sent to their respective stockrooms. Raw materials are stored in one building, while standard parts and purchased finished items are stored in a separate stockroom, each laid out and equipped to serve its particular purpose, with maximum convenience, efficiency and economy in handling. Although many withdrawals by the various departments are made from the main stockrooms, a system of department feeder stockrooms has been established to expedite service.

Material furnished by customers, and material designated by the Army as GFE and by the Navy as GFM, is stored in a separate locked room. All records accounting for this equipment are handled independently of the company purchased stock.

Copies of all purchase orders are sent to the follow-up department of purchasing. There they serve to

actuate a tickler system to insure the delivery of the many items required in accordance with the schedule necessary to meet production requirements.

This department handles many of the traffic matters such as routing freight, checking freight bills, freight allowances, rates, and many other transportation matters. It has proved advantageous to have traffic matters closely coordinated with the follow-up system of the purchasing department since they are both working toward a common end—delivery of the parts or materials in a safe, logical, economical and expeditious manner consistent with the requirements of production.

Coordination

This coordination accomplishes a maximum amount of necessary detail with a very minimum of red tape. Many of the traffic matters pertaining to domestic shipment from the plant are operated from this same department. The shipping department, as well as others which have already been mentioned, all operate under the direction of the Material Supervisor, and the policy of placing the responsibility with this department for all material from the time of the initial release by engineering to its delivery in a finished product continues to be a very satisfactory arrangement.

The Material Supervisor also has jurisdiction over matters of exportation in connection with the shipment of materials, parts, or airplanes to many foreign destinations. All the necessary arrangements are made through the traffic department, operating under the Material Supervisor, to prepare the necessary negotiable documents which are turned over to the treasury department to obtain collection on the materials, parts, or airplanes shipped. Matters of import, Customs regulations, drawback procedure (obtaining refunds from the United States Treasury Department on duties paid on imported materials) are also handled by this department.

A relatively small number of employees handling millions of dollars worth of materials annually indicates that this type of organization is efficient. A survey was recently made of a number of industrial plants operating in this country, and it was concluded that the system as now in operation best served the requirements of this particular industry. That this organization of material procurement and handling is a sound structure for aircraft manufacturing, is further indicated by the fact that several other companies in the industry have adopted substantially the same system of material supervision during the past five years.



Loading and unloading of material from the plant's railroad spur is facilitated by an overhead monorail system.

Fig. 4. The perpetual inventory card is the heart of the supply system, carrying the essential information for stock, purchasing, cost, material requirement, and production purposes.

Fig. 5. The requisition on stores is a five-part form, each copy identified by a distinctive color. The fifth copy is on canary tag, punched for attachment to the delivery.

PRINCIPAL ITEMS BOUGHT BY CONSOLIDATED

Aluminum alloy sheet, extrusion, tubing, shapes, casting, forgings, etc.

Steel parts, tubes, bars, castings, forgings, etc.

Bolts, nuts, and standard parts.

Machinery and tools.

Fabricated parts, including gear boxes, wing panels, pontoon floats, engine mounts, landing gear oleos, cowling, seats, de-icer boots, instruments, exhaust collectors, etc.

Plant and office equipment.

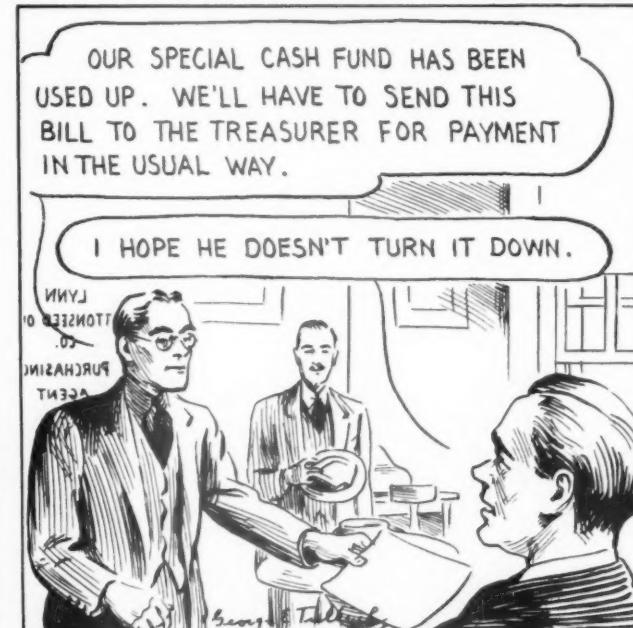
Volume of purchases is approximately
fifty million dollars a year

Fig. 6. Receiving reports are made in five copies, for (a) finance, (b) receiving and inspection, (c) stock, (d) advance purchasing, stock record, and production, and (e) freight file.

Fig. 7. Rejection reports specify the particular deficiency of the material. One copy goes to production, one to inspection, and one to the vendor.

PEN-POINTS ON PURCHASE LAW

BY H. H. SHIVELY, BABSON INSTITUTE



The Purchasing Agent's Authority To Purchase On Credit

IN most modern businesses, the purchasing agent is what is sometimes called a general agent. Normally, he has authority to carry on a series of activities for his company. Those who deal with him take it for granted that he has this type of authority. Such is particularly true when the purchasing agent is ensconced in well-appointed offices, and when the general impression is given that there exists a wide latitude in purchasing.

To tell such an agent that he is to purchase only for cash is to limit him to a discretion less than is usual. A limitation

of this kind would not be known by salesmen, nor expected. They would not be bound by it. If, relying on appearances, they sold this officer on credit, the company would be responsible for payment, regardless of the fact that it had already advanced the money to cover the transaction.

In the particular instance pictured here, the purchasing agent has, of course, been negligent in adhering to the instructions of his superior financial officer, which the implied terms of his employment obligate him to follow.

SCHEDULING A YEAR'S PURCHASES

LOOKING back over the year, many a Purchasing Agent is impressed—and depressed—by the apparent lack of orderliness in the purchase of stock items, the frequent repeat requisitions, the threatened shortages on some items, the unbalanced inventory, and the unevenness of the work burden that devolves upon the purchasing department. The remedy for that situation has been found, in one purchasing department, by looking ahead instead of back, and scheduling the year's purchases so as to distribute the work reasonably evenly, at the same time insuring a periodical check on inventories and consumption.

Imperial Oil Limited, of Toronto, and its affiliates, International Petroleum Company, Ltd., and Tropical Oil Company, have for several years accomplished this simply and systematically, so far as their own particular requirements are concerned. The first step is to group all commodities regularly purchased for

current use and stock purposes into forty classes, each of which is identified by a class number, arbitrarily assigned. The plan provides gaps in the numerical series so that the classification may be expanded or further subdivided if necessary without disturbing the logical sequence.

The purchasing department is comprised of three buying divisions, each of which is responsible for certain of these commodity classes. Consequently, each of the groups has, in addition to the identifying class number, a letter—A, B, or C—indicating the buying division handling this particular group.

The plan contemplates that requirements of all stocked commodities shall be purchased only four times per year. The calendar year is therefore divided into four quarters, and each of these quarters is divided into thirteen "buying periods" of one week, numbered from 1 to 13. This is definitely set up on a

Class Number	Commodity Class Title	Buying Division	Buying Period	Class Number	Commodity Class Title	Buying Division	Buying Period
00	Commissary and Recreational Supplies	A	1	54	Stencils, Metal	C	7
	Including athletic equipment; cameras and films; laundry and toilet accessories; polishes, all kinds; tobacco excluding X-ray equipment; Class 2, textiles (Class 02); cooking utensils (Class 03); beverages, foods (Class 01); proprietary manufacturers, insecticides and remedies (Class 14).			55	Metal, Ore, Ingot and Bar	C	12
01	Beverages and Foods	A	3	57	Metal, Plates and Sheets	C	11
02	Textiles, Textile Products, Wearing Apparel (All Kinds)	A	4	59	Metal Structural Shapes	C	12
04	Furniture (All Kinds) and Office Equipment	A	7	61	Metal, Manufacturers of, Not Elsewhere Classified	C	9
05	Household Equipment	A	7	62	Tube Products, of All Metals	C	6
07	Medical, Hospital and Laboratory Equipment and Apparatus	A	12	65	Fittings for Pipe and Tubing	C	4
09	Surgical Dressings and Instruments	A	2	67	Cocks, Valves, etc.	C	4
10	Groceries, Oils and Waxes	A	11	70	Bolts, Nuts, Rivets, Screws, Washers	C	2
12	Enamels, Lacquers, Paints, Hair Starch and Varnishes	A	5	73	Wire and Wire Products	C	1
14	Chemicals, Drugs, Dyes (Excluding Textile), Gases	A	8	74	Castings (from Specified Patterns)	C	8
17	Lumber, Timber	A	9	75	Containers, for Shipping Company's Products or Samples	C	1
19	Tools, Small	A	10	77	Asbestos, Leather, Rubber, Manufacturers of, and Accessories, Not Elsewhere Classified	C	5
20	Hardware, Builders	A	10	79	Drilling and Production Equipment	C	10
26	Minerals, (Non-Metals) and Manufactures Thereof	B	1	80	Domestic Heating and Plumbing Equipment	C	10
27	Electrical Equipment and Accessories	B	3	83	Periodicals (Magazines, Newspapers, etc.) Subscriptions to Books, Fiction, Text, etc.	A	9(8)
28-29	Machinery and Plant Equipment	B	7	92	Paper and Paper Products	A	12
31-36	Auxiliary Plant Industrial Equipment	B	11	96	Charts, Labels, Tags, Transfers, Lithographed or Printed	A	3(8)
42	Transportation Equipment	B	9	97	Stationery, Embossed Lithographed or Printed	A	9(8)
48	Railway Rolling Stock	B	12	98	Stationery, Embossed Lithographed or Printed	A	7(8)

NOTES

- (a) Class 96: "Charts" are to be requisitioned twice yearly, i.e., in first and third quarters. "Labels and Tags", excluding Atlas tire labels and stickers, are to be requisitioned annually, i.e., in fourth quarter. Other items are to be requisitioned each quarter.
- (b) Class 97: "Stationery" groups 1, 3 and 4 are to be requisitioned in third quarter only; groups 2 and 5 to be requisitioned in second quarter only.
- (c) Class 98: "Stationery" groups 6 and 8 are to be requisitioned in second quarter only; groups 7, 9 and 10 to be requisitioned in first quarter only.
- (d) Class 99: "Staple Stationery" is to be requisitioned in first and third quarters only.
- (e) Class 93: "Periodicals (Magazines, Newspapers, etc.). Subscriptions to" are to be requisitioned in fourth quarter only. "Books, Fiction, Text, etc." are to be requisitioned as required.

CHART EXPLANATION

General: This chart summarizes all commodities regularly purchased for current use and stock purposes. Requirements of all stocked commodities are purchased only four times per year.

Class Numbers and Grouping:

All allied commodities are grouped, and each group is given a class number which has been arbitrarily assigned, as shown above.

Buying Divisions:

The Purchasing Department is comprised of three Buying Divisions, "A", "B" and "C", each of which purchases the certain classes of commodities as indicated above.

Buying Periods:

Each quarter of the year is divided into thirteen periods of one week each, known as Buying Periods, thus Buying Period "1" represents the first week in January, April, July and October (see "Weeks Applying to Buying Periods" hereon), and definite orders should be received by successful vendors during such period.

WEEKS APPLYING TO BUYING PERIODS

Buying Period	(Commencing Monday)												Buying Period
	Jan. 1	Apr. 1	July 1	Sept. 30	Oct. 7	Jan. 8	Apr. 8	July 8	Sept. 15	Oct. 14	Jan. 15	Apr. 15	
1	—	8	—	8	—	8	—	8	—	8	—	8	1
2	—	15	—	15	—	15	—	15	—	15	—	15	2
3	—	22	—	22	—	22	—	22	—	22	—	22	3
4	—	29	—	29	—	29	—	29	—	29	—	29	4
5	—	—	—	—	—	—	—	—	—	—	—	—	5
6	Feb. 5	—	May 6	—	Aug. 5	—	Nov. 4	—	—	—	—	—	6
7	—	12	—	13	—	12	—	11	—	11	—	11	7
8	—	19	—	20	—	19	—	18	—	18	—	18	8
9	—	26	—	27	—	26	—	25	—	25	—	25	9
10	Mar. 4	—	June 3	—	Sept. 2	—	Dec. 2	—	10	—	—	—	10
11	—	11	—	10	—	9	—	9	—	9	—	9	11
12	—	18	—	17	—	16	—	16	—	16	—	16	12
13	—	25	—	24	—	23	—	23	—	23	—	23	13

chart for the year in advance. In 1940, for example, Buying Period No. 1 applied to the weeks starting with January 1, April 1, July 1, and September 30. Buying Period No. 2 applied to the weeks starting January 8, April 8, July 8, and October 7. And so on.

The third step is to assign each of the groups to a definite buying period. This is done so as to distribute the work of each buying division evenly throughout the quarter, not more than two commodity classes coming up for consideration by any one buying division in any given week. For example, in Buying Period No. 1, the first week of January, Division A buyers are looking after commissary and recreational supplies, Division B buyers are busy on non-metallic minerals and manufactures thereof, and Division C buyers are concerned with wire and wire products. Except for unforeseen emergencies, these particular groups can then be forgotten until the first week of April, and again until the first week of July and of October. In Buying Period No. 2, the Division A buyers are turning their attention to surgical dressings and instruments, while the Division C buyers are working on bolts, nuts, rivets, screws and washers.

This does not necessarily imply that all purchasing is done on a three months basis. It does mean that each group comes up for study and attention, stock inventories and manufacturing requirements can be systematically checked, requisitions compiled, and the appropriate buying policy established on each item. Emergency requirements are largely eliminated because nothing is overlooked. Orders can be consolidated far more effectively than if requirements became known only through the medium of isolated and unrelated requisitions. Systematic attention makes for economy in storekeeping expense, the issuing of orders, receiving and other mechanical details of purchasing.

Some stationery items are requisitioned only once a year, in a specified quarter.

The inventory situation has been quite satisfactory under this plan, which effects a constant and even turnover through the rotation of each item, and results in an inventory well balanced physically and steady in respect to the financial investment.

One of the principal advantages is that when vendors are acquainted with the schedule, sales effort is concentrated on each group during the appropriate buying period, rather than being diffused from week to week and from day to day, avoiding much confusion, useless calls and interviews—a distinct advantage from both the buyer's and the seller's angle.

The entire schedule, including a comprehensive statement of what each commodity group covers, and the specific dates of the buying periods, is printed annually in the form of a Purchase Schedule Chart, 16 inches square, which is furnished to all concerned, providing a guide and index of the year's activities for the requisitioning department, the purchaser and the vendor alike.

The practical working of the system can best be visualized by noting the specific and detailed classification and schedule, as follows:

BUYING DIVISION A

Class 00—Commissary and Recreational Supplies. Including athletic equipment; cameras and films; laundry and toilet accessories; polishes, all kinds; tobaccos; excluding X-ray equipment (Class 07); textiles (Class 02); cooking utensils (Class 05); beverages, foods (Class 01); proprietary disinfectants, insecticides and remedies (Class 14). *Buying Period No. 1.*

Class 01—Beverages and Foods. *Buying Period No. 3.*

Class 02—Textiles, Textile Products, Wearing Apparel (All

Kinds). Including cordage; fabrics; fibre; flags; footwear; oakum; safety clothing and hats; sponges; tents; waste; wipers, etc. *Buying Period No. 4.*

Class 04—Furniture (All Kinds) and Office Equipment. Including filing cabinets; calculating, check-writing and duplicating machines; dictaphones; radios; safes; typewriters, etc. *Buying Period No. 7.*

Class 05—Household Equipment. Including aluminum, brass, granite, steel and wooden utensils; china; cutlery; floor and table coverings, excluding cotton, linen and oil-cloth (Class 02); refrigerators; silverware; stoves; toasters, etc. *Buying Period No. 7.*

Class 07—Dental, Hospital and Laboratory Equipment and Apparatus. Including accessories; precious metals; X-ray and sterilizing apparatus; excluding brushes (Class 19); chemicals and drugs (Class 14); bottles (Class 26); cans (Class 75). *Buying Period No. 12.*

Class 09—Surgical Dressings and Instruments. Including gauze bandages; first aid kits; excluding felts, tapes and webbing (Class 02); rubber tubing (Class 77). *Buying Period No. 2.*

Class 12—Greases, Oils and Waxes. Including animal, mineral, vegetable; excluding allied polishes (Class 00). *Buying Period No. 11.*

Class 13—Enamels, Lacquers, Paints, Naval Stores and Varnishes. Including dryers; fillers; gold leaf; painting kits; rosin; turpentine. *Buying Period No. 5.*

Class 14—Chemicals, Drugs, Dyes (Excluding Textile), Gases. Including abrasive, boiler, fire extinguishing and insulating compounds; drugs; fluxes; industrial dyes, glues and pastes; proprietary disinfectants, insecticides and remedies. *Buying Period No. 8.*

Class 17—Lumber, Timber. Including corks; gauge poles; ladders; miscellaneous manufactured wooden articles; railroad ties; excluding shipping containers (Class 75); wooden utensils (Class 05). *Buying Period No. 9.*

Class 19—Small Tools. Including brooms; casing, tubing and pipe tongs; cloth and paper abrasives; handles; industrial brushes; metal and wood-working hand tools; steel measuring tapes; steel wool; excluding cutlery (Class 05). *Buying Period No. 10.*

Class 20—Builders Hardware. Including barrel bolts; cupboard catches; door closers; hasps; hinges; hooks; locks; glaziers' points. *Buying Period No. 10.*

Class 93—Subscriptions to Periodicals (Magazines, Newspapers, etc.); Books, Fiction, Text, etc. *Buying Period No. 9.* Subscriptions to periodicals are to be requisitioned in the fourth quarter only. Books, etc., to be requisitioned as required.

Class 95—Paper and Paper Products. Including roofing; sheathing; toilet, wrapping paper; excluding stationery (Classes 97-99). *Buying Period No. 12.*

Class 96—Charts, Labels, Tags, Transfers, Lithographed or Printed. *Buying Period No. 3.* Charts are to be requisitioned twice a year, in the first and third quarters only. Labels and tags, excluding Atlas tire labels and stickers, are to be requisitioned annually, in the fourth quarter. Other items are to be requisitioned each quarter.

Class 97—Stationery, Embossed, Lithographed or Printed. Including group (1) Accounting, including yield and cost; (2) Cheques, envelopes, letterheads and telegrams; (3) Equipment, plant; (4) Invoicing, including debit and credit notes; (5) Labor, welfare. For groups (1), (3) and (4), *Buying Period No. 9*, to be requisitioned in third quarter only. For groups (2 and 5), *Buying Period No. 7*, to be requisitioned in second quarter only.

Class 98—Stationery, Embossed, Lithographed or Printed. Including group (6) Manufacturing survey; (7) Marketing survey and sales promotion; (8) Material procurement; (9) Operating; and (10) Transportation, marine, railway and truck. For groups (6) and (8), *Buying Period No. 7*, to be requisitioned in second quarter only. For groups (7), (9) and (10), *Buying Period No. 2*, to be requisitioned in first quarter only.

Class 99—Staple Stationery. Including filing and waste baskets; inks; office mucilage and paste; blotting, carbon, plain and ruled papers; typewriter ribbons, etc. *Buying Period No. 6.* To be requisitioned in first and third quarters only.

Continued on page 121

By R. H. WILSON

General Service Manager
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STOCKROOM

PURCHASING

Supply buyers must adjust their program to market conditions, but the resulting "speculative profits" may turn out more apparent than real. This article includes a method of computing the risks on a scientific basis and shows the effect of price trends on stock planning.

IN a rising market there is always a tendency to purchase stock in larger lots than usual. The buyer hopes that the saving made by laying in a large stock of an item in advance of an increase in price will be greater than the extra operating costs incurred by carrying a larger stock. The same principle, in reverse, holds true in a falling market. The buyer naturally buys as little as possible in this case, hoping that the saving made by purchasing small amounts until the

price drops to a stabilized low will be greater than the increased operating costs incurred by purchasing in small lots.

The object of this paper is to define the risk involved so that the buyer will know in advance of purchasing just what risk he is taking. This gives the buyer a definite yardstick to gauge his purchasing so that his judgment of the market can be used with a definiteness which has not been the case in the past.

Normal Operating Charges

In a previous paper it has been shown that the operating charges for any stock item vary with the amount ordered and the yearly consumption of the item. Typical cases are shown in Table I where the operating costs are plotted against the size of order for four items with different rates of consumption. These are in a stockroom where the carrying rate is 9% and the average cost of placing restocking orders is 70c each determined as described in the paper referred to above. Obviously, the size of restocking order to place is that for which the variable operating charges are least as indicated by the crosses. In order to obtain the most economical ordering amounts in a convenient form they can be arranged as shown in Table II.

This table can be used provided there are no unusual conditions surrounding the purchase. For example there are cases where larger lot purchases can be justified provided a large enough discount is obtained. A method of handling these and similar unusual cases was described in the August, 1940 issue of PURCHASING.

It will be seen from Table II that as the stock item increases in importance (i.e. as the amount of it used per year increases) it is economical to order more frequently.

Consequently, this method of ordering which keeps operating costs at a minimum has a tendency to favor a declining market more than a rising market because of the rapid turnover in those items in which large investments are made. However, both sides of the problem should be considered.

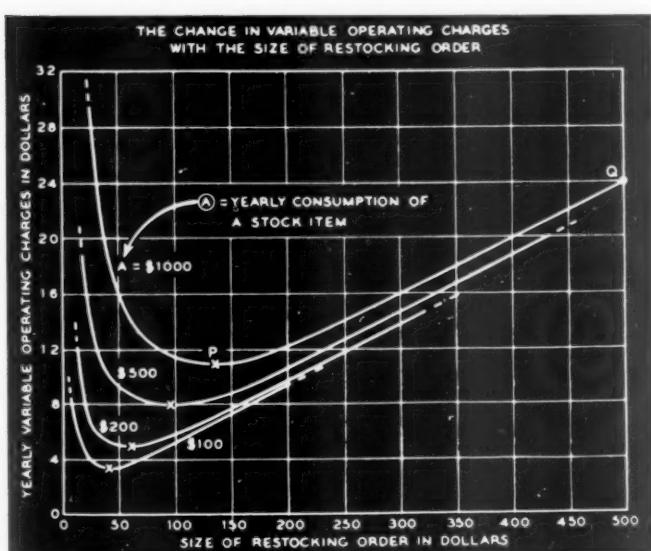


TABLE I

Suppose a rising market is taken first. The consideration, then, is whether, in order to take advantage of present prices in a rising market, 3 months', 6 months', or even a larger supply of stock should be ordered instead of the amount indicated by Table II.

The problem as applied to one stock item can be described as follows: The buyer expects that prices will advance. Suppose the cost of the stock item used in a year is \$1,000, then from Table II

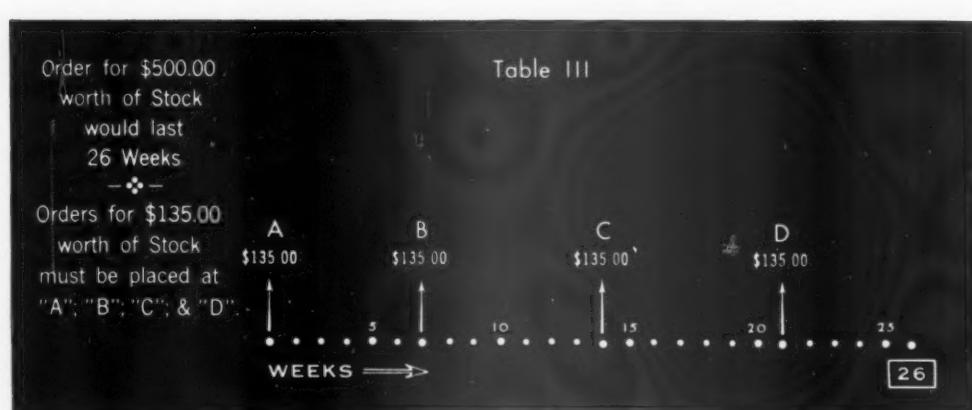


TABLE II		
Estimated Yearly Rate at Which Stock Will Move	Ordering Amount	Time Order Will Last
DOLLARS	DOLLARS	WEEKS
5	9	94
10	12	62
15	15	52
20	18	47
40	25	32
60	30	26
100	40	21
150	50	17
200	60	16
300	70	12
400	85	11
600	105	9
800	120	8
1000	135	7
2000	195	5
3000	245	4.2
5000	330	3.4
10000	495	2.6
15000	635	2.2
20000	760	2

(which indicates the most economical amount to purchase when operating costs alone are considered) it is seen that the amount to order is \$135 worth, or 7 weeks' supply. Also suppose that the buyer's information of a probable price increase is reasonably sound so that he is tempted to lay in 6 months' supply. What is the risk?

In the first place, apart from the fact that there is more danger from depreciation and obsolescence and the risk of a declining demand, there is a definite cash loss. This can be seen immediately from Table I, which shows that the operating charges increase from \$11 per year to \$24 per year (120%) when stock is purchased on a 6 months' basis (\$500) instead of the most economical ordering amount of \$135.

Now suppose the six months' supply is not ordered, but the most economical amount, \$135 worth, and suppose the price increases during the first seven weeks. This increase in price will then have to be paid on subsequent orders placed during the next six months' period. They will occur at the end of seven, fourteen and twenty-one weeks. If the buyer had ordered the six months' supply instead of the seven weeks' supply he would save the additional amount caused by the

TABLE IV

RISK OF STOCK PURCHASING—RISING MARKET

This table gives the risk involved in ordering 6 months' stock of an item (because of rising prices) instead of the most economical ordering amount as given in Table II.

EXAMPLE Where the annual consumption of a stock item is \$1000, the following table shows that there will have to be a 1.6% increase in price in the first month to justify purchasing six months' stock, a 2.4% increase if the price is raised in the second month; a 3% increase if the price is raised in the third month and a 5% increase if the price is raised in the fourth month. It also shows that if the increase in price does not occur, the purchase of six months' supply and consequent increase in stocking charges is the same loss as a 2.5% increase in price.

In this way the risk of making a six months' purchase is well defined.

EST. YEARLY RATE (IN DOLLARS) AT WHICH STOCK ITEM WILL MOVE	ORDERING AMOUNT—6 MONTHS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	PERCENTAGE INCREASES IN PRICE NECESSARY TO BREAK EVEN WHEN PURCHASING SIX MONTHS' SUPPLY OF STOCK						EQUIVALENT PERCENTAGE INCREASE IN PRICE IF INCREASE IN PRICE IS NOT REALIZED	
		IF PRICE INCREASES WITHIN							
		0-1 Mo.	1-2 Mos.	2-3 Mos.	3-4 Mos.	4-5 Mos.	5-6 Mos.		
\$ 100	\$ 100	.5	.5	.5	.5	.5	.5	.2	
500	500	1.5	1.5	3	3	5	5	2	
1,000	1,000	1.6	2.4	3	5	5	7	2.5	
5,000	5,000	2	2.5	3	4.5	7	17	3.5	
20,000	20,000	2	3	3.5	5	8	27	4.0	

ORDERING AMOUNT— 3 MONTHS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	ESTIMATED YEARLY RATE (IN DOLLARS) AT WHICH STOCK ITEM WILL MOVE	PERCENTAGE INCREASE IN PRICE NECESSARY TO BREAK EVEN WHEN PURCHASING LARGER AMOUNT OF STOCK INDICATED IN COLUMN I						EQUIVALENT PERCENTAGE INCREASE IN PRICE IF INCREASE IN PRICE IS NOT REALIZED	
		IF PRICE INCREASES WITHIN							
		0-1 Mos.	1-2 Mos.	2-3 Mos.	3-6 Mos.	6-9 Mos.	9-12 Mos.		
\$ 500	.4	.4						.4	
1,000	.5	.5						1	
5,000	.9	2	6					3.0	
20,000	1.2	2	6					3.5	

TABLE V-A

ORDERING AMOUNT— 6 MONTHS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	100	.5	.5	.5	.5			.2
	500	1.5	1.5	3				2
	1,000	1.6	2.4	3	5			2.5
	5,000	2	2.5	3	11			3.5
	20,000	2	3	3.5	16			4.0

TABLE V-B

ORDERING AMOUNT— 12 MONTHS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	50	2	2	2	2	2		.9
	100	3	3	3	5	8	8	2
	1,000	4	4	5	6	8-14	28	3
	5,000	4	5	5	7	8-15	19-59	4
	20,000	4	5	5	7	9-17	17-213	4

TABLE V-C

RISK OF STOCK PURCHASING—RISING MARKET

This table gives the risk involved in ordering three months', six months' or twelve months' supply of an item (because of rising prices) instead of the most economical ordering amount as given in Table II. It is generally applicable to any stockroom.

increase in price of the item on these three orders; but these savings on the six months' order are wholly or partially offset by the extra cost of carrying the larger supply as described above.

Consequently, in order to determine the actual savings realized, it is important to know just how much the price of the item must increase in order to offset the extra operating charges. Also, since the operating charges are the same regardless of when the change in price occurs in the six months' period, in order to offset them it will be necessary for the increase in price of the item to be greater if it occurs after any of the seven weeks' orders have been placed because the saving will be realized on a smaller number of orders.

It is found by actual calculation that if the increase occurs during the first seven weeks, the increase in price of the stock item will need to be 1.6% in order to offset the operating charges, while if the increase occurs after the second seven weeks' order has been placed, but before the third (between seven and fourteen weeks), it will need to be 2.4% and so on.

Short-Term and Long-Term Buying

The graphical representation in Table III illustrates this more clearly. At A if a six months' order is placed for \$500 it is seen from Table I that there is an increase in operating charges (represented by P and Q on Table I) from \$11 to \$24 per year; but since this is only a six months' order the increase will be one-half this or \$6.50. Normally, however, there would be an order placed for \$135 at A followed by similar

orders at B, C and D at 7 week intervals. Now in order for the stockroom to break even when buying six months' stock the increase in price on the orders that would be placed normally at B, C and D during the six months will have to equal the increase of \$6.50 in operating charges.

Suppose the price increases before B (i.e. before the first 7 weeks) then the orders at B, C and D will carry the increase and if the increase is 1.6% it will amount

$1.6 \times 3 \times \$135$ or \$6.48 so any increase better than 1.6% will justify the 6 months' purchase. But suppose the increase does not occur until 8 weeks, then only the orders at C and D will carry the increase and the price will have to increase by 2.4% on the two

orders to justify the 6 months order ($2.4 \times 2 \times 135 = 100$ \$6.48). Similarly it can be shown that the price will have to increase by 5% if the increase occurs between C and D, i.e. between 14 and 21 weeks. After D there is no order for the remainder of the period of 6 months on which to realize a saving, consequently no percentage value can be given for the time between D and the end of the six months' period.

Computing the Risk

Table IV shows the percentage price increases to break even not only for an item with an annual consumption of \$1000 but for \$100, \$500, \$5,000 and \$20,000 as well. The blank spaces are for periods for

which no percentage can be given as explained above.

Perhaps the buyer, however, might risk buying three months' supply instead of six, or it may be that the chance of an increase in price is so definite that he is tempted to purchase 12 months' supply. It is just as easy to prepare these tables as the six months' table. For convenience, they have been assembled into sections of a common table, Table V, divided into three parts; Table V-A for three months' purchases; Table V-B for six months' purchases and Table V-C for 12 months' purchases. Table V-B is, of course, the same as Table IV.

If by purchasing a larger amount a discount is obtained then the table should be used as before but the amount of the discount should be subtracted from the percentage increase in price.

A similar line of argument to that given above for a rising market applies to a declining market except that the risk in this case is in buying less than the most economical amount with the idea that prices are going to drop. The risk in this case has also been worked out mathematically and is also divided into three parts: Table VI-A for two weeks' purchases, Table VI-B for four weeks' purchases and Table VI-C for two months' purchases.

Small Lot Buying is Impracticable

From these tables it is apparent that on the slower moving items it does not pay to purchase in lots smaller than the normal most economical ordering amount in the hope of taking advantage of a decline in price. For example, let us assume that the buyer feels that this is a falling market and on looking at Table VI-B may feel justified in only purchasing four weeks' supply

of a stock item moving at the rate of \$1,000 a year. He will have noticed that if the price drops more than 1% he has made a profit by so doing, but he would hesitate to take the same step on a slower moving item such as one moving at the rate of \$100 per year because in this latter case the price would have to drop 7% at least, in order to justify the smaller purchase.

Although in the case of a faster-moving item the risk is not so great, it should be kept in mind that it is in this class of purchasing that discounts can often be realized. If by purchasing in smaller lots a discount is lost, then the table should be used as before, but the amount of the discount should be added to the percentage decrease in price necessary to break even. Thus it can readily be seen that there are likely to be many instances even in the faster moving items when it is not practicable to purchase in smaller lot sizes on a falling market.

The values given in Table V and VI vary with the operating conditions of the stockroom under consideration, but the effect is not of any practical importance as far as the use of these tables is concerned. Consequently they can be universally used for any stockroom.

In conclusion, it is apparent from the above that when purchasing stock items in a rising or falling market the net saving is not as large as might appear to be the case, also more net savings can normally be realized by increasing the size of orders on a rising market than by decreasing the size of orders on a falling market. Tables V and VI definitely determine the degree of risk run in buying in anticipation of either of these conditions and are very valuable in exercising good judgment in this form of buying.

RISK OF STOCK PURCHASING—FALLING MARKET

This table gives the risk involved in ordering 2 weeks', 4 weeks' or 2 months' supply of stock of an item (because of falling prices) instead of the most economical ordering amount as given in Table II. It is generally applicable to any stockroom.

ORDERING AMOUNT— 2 WEEKS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	EST. YEARLY RATE (IN DOLLARS) AT WHICH STOCK ITEM WILL MOVE	PERCENTAGE DECREASE IN PRICE NECESSARY TO BREAK EVEN WHEN PURCHASING SMALLER AMOUNT OF STOCK INDICATED IN COLUMN I			EQUIVALENT PER- CENTAGE INCREASE IN PRICE IF DECREASE IS NOT REALIZED	
		IF PRICE DECREASES WITHIN				
		0-1 Mo.	1-2 Mos.	2-3 Mos.		
\$ 50	34	39	44		57	
100	17	23	33		38	
200	8	13	30		24	
500	3	5	—		13	
1,000	1	2	—		7	
5,000	.1	—	—		.6	

TABLE VI-A

ORDERING AMOUNT— 4 WEEKS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	\$ 50	16	19	23	24
	100	7	10	15	15
	200	3	5	13	9
	500	1	—	—	1
	1,000	.3	—	—	—

TABLE VI-B

ORDERING AMOUNT—2 MONTHS' SUPPLY INSTEAD OF AMOUNT OBTAINED FROM TABLE II	\$ 50	6	6	10	7
	100	2	2	10	4
	300	.4	.4	—	.4

TABLE VI-C

Giving a filing cabinet drawer a 20-year service test in a few hours.



BUYING PAPER

BY LABORATORY TEST



The ash test tells about fillers and pigments in paper.

THE Metropolitan Life Insurance Company has its own printing plant in which, solely for the company's own needs, as many as 1,500 jobs may be in process at once. Those jobs may be ranging from fifty business cards to 18,000,000 copies of one form. The company must buy paper as a material to be processed in the plant, as the basis of advertising and public information tools, and as tools which will be used by its own personnel. These last may be printed tools such as letter heads and forms, or may be unprinted like carbon papers.

Papers bought to scientific specifications and checked and inspected on delivery in a well equipped laboratory, can function better in the printing plant and serve better their final purposes. Therefore a labora-

By LEWIS S. REID

Manager, Standardization Laboratory
The Metropolitan Life Insurance Company

tory was established in July, 1936, for testing papers, and otherwise furnishing technical assistance. The functions of the laboratory include tests of more than 90 different materials and products ranging from filing cabinets through carpets, chairs, desks, desk pads, erasers, inks, linoleums, pastes, paints, janitors supplies, and so on.

The functional testing of a filing cabinet is a good example of what goes on. In this, a reciprocating arm which is powered by a small electric motor is hooked up to the front end of a fully loaded filing cabinet drawer. The arm pulls the drawer out and pushes it back at the speeds and with the shocks which would be used by a good file clerk. The process is repeated 50,000 times, which is about the amount of service the drawer would be given in twenty years of normal use. Then the drawer supporting mechanisms are inspected for wear and failures.

Papers to be printed, require more than functional tests. In common with some other materials, they are tested to set up specifications and routines for deliveries of materials; to find the advantages and uses of new products; to find the real reason for complaints; and to give technical advice on the problems of printing or other uses.

Standards have been established for four types of bond papers, three of ledger, two of index, five of book, two of tag, seven of envelope, two of blotting, and one each of adding machine, carbon, bristol, safety, fan-fold, glassine, pressboard and legal. Bond grades, for example, are 100% rag, 75% rag, 50% rag, and 100% sulphite. The difference between bond grades is somewhat that of beauty, crackle, etc., but is mostly that of the two factors of permanence or resistance



Accurate weighing gives the results in many chemical tests.

to internal or chemical changes, and durability or resistance to such physical factors as handling, folding and carrying in pockets.

Here are the routine tests made of papers. In addition, there may be special tests for special problems.

Physical Tests

BASIS WEIGHT. This is done with a special scale. Usually four sheets $8\frac{1}{2}'' \times 11''$, cut accurately to size within .01", are weighed, their weight being readily converted into that of a ream. If other sizes of sheets are weighed, the weight of the ream is found with equal speed by using a conversion chart which is on the wall and always in sight.

THICKNESS is measured within .0001" by a dial gauge. Thickness is important on book papers, ledgers, indexes, and all others which must be filed, bound, etc. Twenty-eight pound ledger stock, for example, can be filed about 200 sheets per inch or 5,200 sheets in a 26 inch file drawer. The nominal thickness per sheet is .005", but it can run from .0048" to .0053". The thickest sheets then can be about 11% thicker than the thinnest ones, which means that with four drawer filing cabinets one extra drawer would be needed for the thick papers for every ten drawers needed by the thin, or for a section of forty cabinets the thick paper would need at least one whole extra cabinet. Thickness also can affect the storage space needed for large lots of books, and the mailing costs of some printed pieces, and the storage space needed for raw materials and unprinted papers, and so on.

FOLDING ENDURANCE is measured on an electric motored machine which gives the test specimen alternate-way double folds and automatically shuts off when the specimen fails from fatigue. Folding endurance is important for policies and other papers which are carried in pockets and unfolded and refolded many times. Sulphite papers may withstand 115 to 400 foldings, high grade bond papers will go up to 3,000 or 4,000.

BURSTING. The sheet is held firmly between two circular clamps, the area within the clamps being exposed to the "bubble" pressure of an expanding rubber diaphragm until the paper fractures. The amount of pressure needed to fracture the sheet is measured

directly on dial gauges. This test indicates the physical endurance of the sheet, and tells a lot about the fibers used in the paper, the sizing, and how the batch was treated in the paper mill beater. Like nearly every test, the findings of this one are cross checked by others.

RESISTANCE TO TEARING. Tested on a direct reading pendulum instrument. The importance of this test is obvious.

ERASING. There is no erasability test which may be read in index numbers, but there are practical tests. One is to tear a sheet in such a way as to get a wide bevel, cross hatch the bevel with various inks, and then inspect that bevel under the "readex"—a device which magnifies surfaces by light reflected from them and not with light passed through them. This will show up any feathering at the tear; feathering being the familiar fuzziness which makes typing over erased spots look different from typing over virgin areas of a sheet. Likewise a directly functional test is made; the paper being marked with blue, red and black inks, those marks being erased, and the surface examined for feathering.

MECHANICAL SMOOTHNESS. A sheet is folded, punctured through its two thicknesses with a hole of exactly controlled size, and mounted between two circular rubber cups which hold the thicknesses together with exactly controlled pressure. A standard amount of air at standard pressure is then passed through the hole through the two thicknesses, and since this air can escape only sideways between the thicknesses of paper, the amount of time taken for the air to escape is dependent upon the air passages between the thicknesses and therefore that time is a measure of the roughness or smoothness of the paper surface—the rougher the surface the more the "hills" holding the paper surfaces apart and the deeper the "valleys" through which the air can escape. Surface smoothness is important to printability, for on a too rough surface it is hard to print fine detail, and a too smooth surface may mean that the sheet has been calendered too much and the ink cannot grip it well.

Light Tests

GLARE AND GLOSS are measured with an optical instrument which reads directly on a scale plus a conversion chart, and which really is a measure of the angle at which the reflected light from the paper polarizes. The light source is electrical and controlled. Too much glare means eye fatigue for readers. Too little gloss can mean too little contrast between paper and ink, which also causes eye strain and fatigue.

OPACITY. The measuring mechanism is within a closed chamber which excludes all external light. The test sample interrupts the light from a 50-foot-candle

electric lamp to a photoelectric cell, the cell registering the amount of light which the paper fails to intercept, and the opacity being read as the simple percentage of the light intercepted to the light originally supplied. Opacity is important whenever printing on one side of a sheet must not show through on the other side, and whenever an envelope, etc., must hide its contents.

READEX. This is a test of paper, as previously mentioned, but also of ink and of printing technique and of type faces. The printed test sample is mounted beneath a transparent plate which holds it flat, then is inserted in an external-light-proof box in which is a controlled electric lamp and magnifying device. The sample then appears, several times its actual size, on a screen at the top of the instrument. All of the light by which the sample is magnified, is reflected from the surface of the sample; none is shown through it. Plainly seen on the enlarged image are any fuzzy edges of the printing, spottiness, halos, and other defects. Although such defects in printing may not be identified by the naked eye, they add up in their effects upon the qualities of printed jobs. The test also is useful in checking up half tone screens.

COLOR PERMANENCE. This is tested in a Fadometer, an instrument within which samples are exposed to controlled light for exact time periods. This is a test of how white papers will turn colored and how colored papers will change color or lose color with exposure to light. The machine also tests inks, rugs, and other products.

Chemical Tests

OIL PENETRATION. A single drop of castor oil is dropped upon a sheet of paper, then the paper is watched under light to see how fast the oil comes through and the oiled area assumes a uniform color. Too slow penetration may mean that the paper will not take ink well. Too fast penetration may mean that ink will stain the paper fibers too much, and that therefore there will be a lessening of the light reflecting which is the foundation of many beautiful Benday effects, etc., in printing. Like many other tests, this one must be interpreted somewhat by the skill of its operator, for a good test man can tell many things which index numbers would not record.

ASH. A test sample is burned and the ashes analyzed. This tells the amounts of pigments and of mineral fillers used to obtain opacity. Too much of these fillers may mean lack of fiber strength in the sheet.

SIZING. The test sample is pulped-up, the resin and other size leached out in fluid form, the water removed, and the residue analyzed. Paper with too little resin or size does not have good writing qualities—blotting paper usually has no resin or size. Sizing is important for easy erasing and for some printing operations. Too much resin may mean that a paper will turn yellow.

Test samples are pulped and leached out before chemical analysis.

ACIDITY. The test sample is pulped-up, leached out, and the fluid tested in a standard pH meter. Too much acidity can mean rapid development of yellowness and brittleness in the paper. The company has yet to be troubled by too little acidity.

FIBERS. The test sample is pulped-up, stained with various standard stains, and examined under the microscope. The stains take different colors on different materials, therefore the operator can see what kinds of fibers have been used, how much of them and how strong they are, and can tell a lot about fillers, etc. Beside the instrument is a color chart for quick comparison.

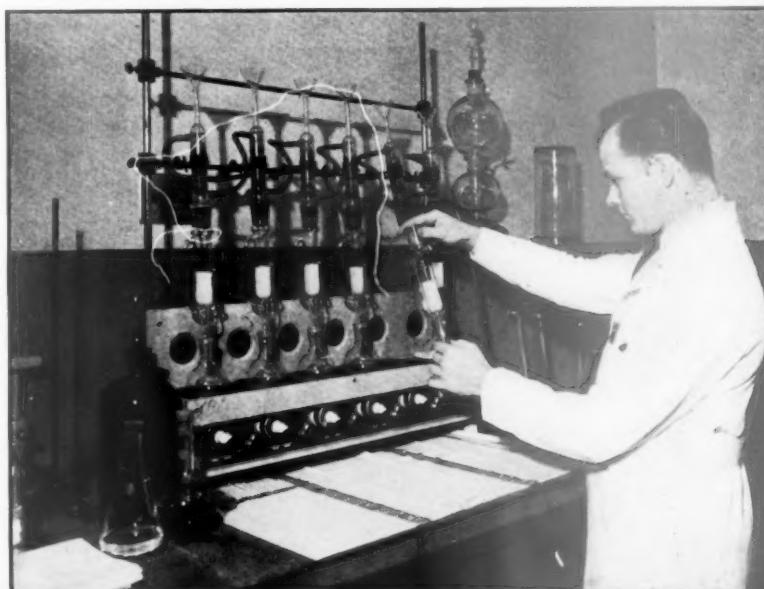
Functional Tests

There are many direct functional tests which may or may not be combined with tests described above. Here are two of them.

PRESS BOARD SCORING AND FOLDING. The test sample is scored and folded in the regular way, then examined under the microscope for cracking, and for other defects.

CARBON PAPER MARKING. The test sample of carbon paper is placed between two sheets of white paper, the lower of which will take the carbon black markings and the upper of which will bear the friction of the test mechanism. Bearing upon the upper white sheet are the stems of a row of glass containers. The first container in the row has no weight but its own, and the succeeding containers are weighted by increments in grams, the weights being placed within them and being readily changeable for new increments of values. The three sheets are then drawn along a flat surface beneath the containers. The lower white sheet is examined to see what weight was necessary to make the carbon mark it to a satisfactory degree, the markings appearing as long grey streaks and being darker beneath the heavier weights.

When the company orders car loads of paper, the order or the covering original contract specifies the type, grade, weight, color, etc., of the paper; the laboratory tests to be used; the sizes and heights of skids; the position of the paper on the skids; the positions of the skids in the freight car; and the marking of the car door through which the loading was done. Specifying of paper starts at the laboratory and continues as a straight line operation through the purchasing department, the paper mill, and to the printing plant. There is little waste motion.





*"I'm sure they told us that the purchasing department
was down this corridor."*

Inspecting fabric to be used in rubber belting.



SELECTION

OF RUBBER BELTING

By CHESTER F. CONNER

The B. F. Goodrich Co.

SELECTION of rubber belting has always been a perplexing problem for the Purchasing Agent. Samples of two different grades look exactly alike to everyone but a belting specialist and yet may differ as much as 50% in price. In fact, the higher priced belt may actually be thinner.

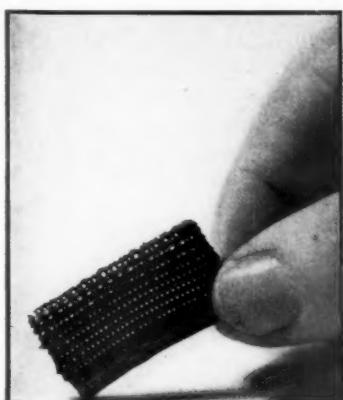
Years ago, the buyer felt he had made some progress when he could talk about duck weights and "friction pulls", but these simple specifications no longer have much significance. With the introduction of the special hard weaves of duck for transmission belts and non-oxidizing frictions, it was discovered that the performance in the shop seemed to have no relationship whatsoever to the weight of



Many conveyor belts are subjected to severe service conditions.

duck or the original strength of the friction. Unfortunately for the buyer, the factors which combine to make a successful rubber belt are mostly hidden so that it is difficult even with elaborate and expensive testing equipment to make comparisons of samples.

In a rubber-impregnated duck belt, some of these factors are: Design of cotton yarn, crimp of yarn, design of weave, inspection of fabric to eliminate pick-outs, foreign matter, protruding knots, etc.; regulation of the percentage of moisture in the duck at the time it is impregnated; aging quality of rubber friction compound; process control of rubber compounds to insure uniformity; flexing life; percentage of inelastic and elastic stretch in the finished product; elimination



Close-up of a cord belt sample treated with acid.



The laboratory is an important factor in process control.

The oven test is important in control of aging properties.

of overcure without danger of undercure, particularly at the press laps; uniform stretch during cure; uniform pressure during cure; and surface treatment.

Many Factors Important

In a conveyor belt there is also to be considered elimination of seams in the carcass, the adhesion of the top covers and pulley side covers to the carcass of the belt, capacity of the cover compounds to withstand various types of abrasion, the capacity of the entire structure of the belt to withstand shocks, the resistance of the cover to the elements, and the proper balancing of the entire conveyor belt structure to permit the belt to wear out rather than fail at some particular part.

The ingredients of rubber belts being almost entirely of vegetable origin, the control of uniformity is a vital factor in all belt constructions. A few years ago, a considerable quantity of Japanese made rubber belting was introduced in some parts of the country. In some cases trial belts seemed to perform satisfactorily and buyers thought they had found an important opportunity to save money. Subsequent belts, sometimes off the same roll, however, failed completely in a short time chiefly due to a lack of uniformity in production.

Repeated attempts have been made to purchase belting by specifications. Probably the best specification of this type is that of the American Petroleum Institute, but to tell whether a piece of belt conforms to the specification, it is necessary to employ a well-equipped laboratory to carry out some rather extensive tests. The best test after all is in actual service, and the user finds that it is less expensive to try out several belts on typical drives in the plant than it is to pay laboratory fees for testing each lot purchased. The loss in production and the added maintenance expense which result from premature belt failures often amount to many times a saving that may be realized

on the original price. The well-equipped belt manufacturer safeguards the reputation of his brands by maintaining controls of uniformity so that a buyer can generally depend on a duplication of performance of the same brand if purchased after a satisfactory trial.

Service is Major Element

The service offered by the supplier is probably one of the most important factors in the selection of rubber transmission belting. On account of the number of size combinations required by any one plant, it usually pays to depend upon a supplier's nearby stock for replacements. The ability of the supply house to assist in making recommendations of the correct belt construction for a given drive deserves consideration. The ability of the supplier to promptly deliver endless rubber belts is an invaluable



service which has been the means of large savings to many plant operators.

Conveyor belting and bucket elevator belting are customarily classified by certain descriptive terms pertaining to fabric weight, friction, adhesion between plies, and tensile strength in pounds per square inch of the rubber cover. These descriptive terms can hardly be called specifications since they define only superficial characteristics of the belt, but they have been of great assistance in grouping various belt constructions into general classifications.

Fabric weight is based on the actual weight of a piece of fabric measuring 42" wide and 36" long at a specified moisture content. Most common weights of duck used in conveyor and elevator belting are 28, 32, and 36 oz. The duck used on conveyor belting is of a softer weave than the so-called hard ducks used in the best quality of transmission belting, these softer weaves being better adapted to the localized stresses involved in conveyor and elevator service. These weight specifications, however, do not completely define the quality of the duck, and with proper testing apparatus it will be found that there is considerable variation in the strength and stretch resistance in fabrics of the same weight.

The friction adhesion between plies of conveyor belting has been more or less standardized in the three grades—12 to 15 lbs., 16 to 19 lbs., and 20 to 24 lbs. Adhesion between plies, however, is not a completely satisfactory measurement of belt quality. More important considerations are the amount of rubber between the plies, the resistance to flexing, and, of even greater importance, the aging characteristics of the compound used. If high adhesion between plies were the sole criterion, a soft, elastic rubber compound similar to that used for office rubber bands could be employed. Such a compound, however, would not perform satisfactorily because of its tendency to deteriorate more rapidly. Tests on belts which have been in service several years reveal the interesting fact that in many cases the friction adhesion reading



Vulcanizing a belt for a coal conveyor.



Splicing a belt to fit the application.

may be higher after this period of service, than other friction compounds which had a higher adhesion immediately after the belt was manufactured.

Only Partly Indicative

The tensile strength of the cover is only partly an indication of the wear characteristics sought, such as resistance to moisture, abrasion, cutting, tearing and gouging. Here again, the slow aging properties of the compound are of vital importance. The number of seams in the fabric carcass of the conveyor belt, whether the seams are butted or lapped, and the location of the seams with reference to the idler pulleys, are important factors in determining the life of a conveyor belt.

The characteristics of the V-type transmission belt are even more difficult to define. Accelerated breakdown tests on laboratory machines reveal that there is a tremendous difference in the durability of V-belts resulting from various methods of construction. One important factor which is often overlooked is the self-cooling capacity of a V-belt. It is actually true that the rubber compounds built into the body of a V-belt can be of high tensile strength and afford strong adhesion to the cords and yet permit an excessive degree

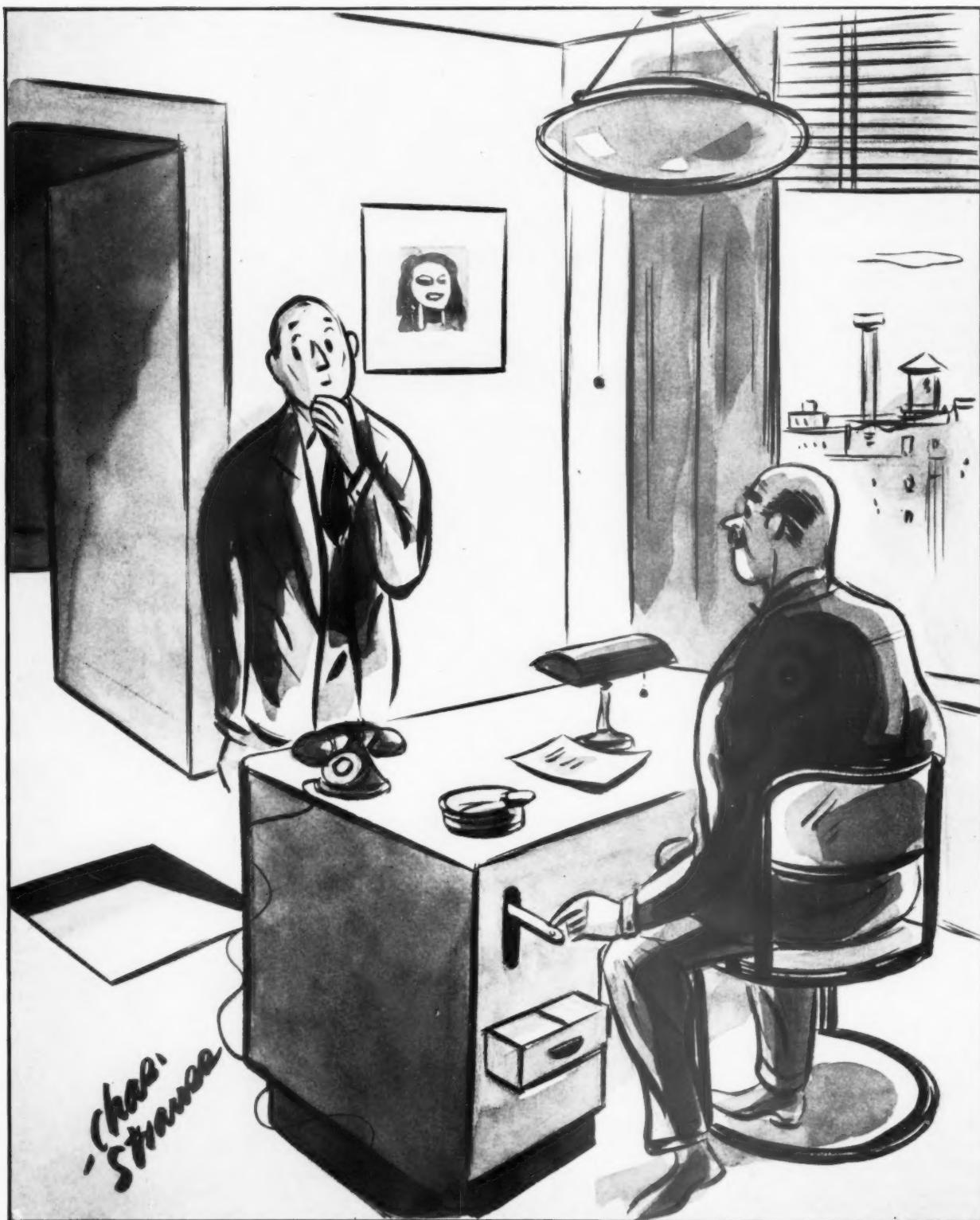
of heat to be generated inside the belt in its rapid bending over the small grooved pulleys. Rubber compounders have displayed considerable skill in the selection of ingredients and methods of manufacture to reduce this internal temperature to a surprising degree with a resultant longer life of the belt structure.

The outstanding success of the V-type belt has focused attention on the value of the cord type of construction. This has resulted in the perfection of both transmission and conveyor belts in which longitudinal cords without any cross threads or cords are now available. These types of belt are capable of withstanding higher stresses, involve less internal friction, and can bend over much smaller pulleys than belts made of woven fabric. They will play an increasingly important part in the solution of transmission and conveyor problems and deserve careful consideration on the part of the belt buyer.

Cord Construction Grows

This development is of particular interest in the conveyor belt field. Some very successful installations have been made during the last few years where performance has exceeded many times that previously realized with fabric belts. The particular type of cord construction used in these installations consists of several plies of small parallel cords with no cross-wise or weft threads. When a piece of this belt is immersed in acid until all of the cotton is eaten out, the resulting structure is a block of rubber filled with small parallel tunnels, indicating that the cords were completely surrounded with a thick insulating layer of rubber. The success of this type of belt under shock loads is because the entire carcass of the belt operates like a cushion. The complete insulation also

Continued on page 117



*"Yes, Mr. Jones, we have developed a very effective
technique for handling insurance salesmen."*

TO the average member of the general public the word "industrial diamond" has little significance, even though occasional newspaper and feature articles have told their readers about the "crown jewels of industry". When it is explained to the layman that industry uses diamonds unsuitable for ornamental purposes (and that includes more than half of those found in nature), a flash of recollection sometimes illuminates his puzzled face. "Why, of course," he'll say, "glaziers use them for cutting window glass."

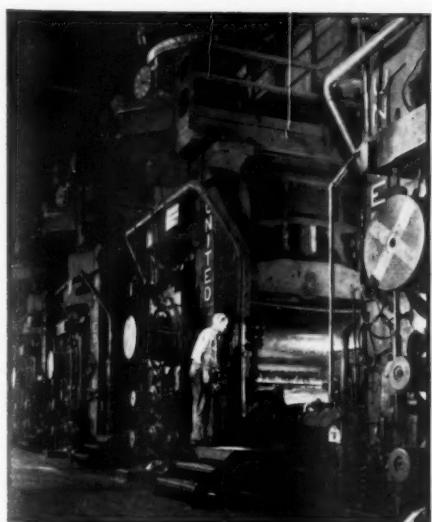
Despite the fact that only a very minute fraction of one percent of industrial diamonds go into glazier's tools, this is a perfectly good example of an industrial use of diamonds. It is usually a matter of great surprise to the public when it learns that the bulk of industrial diamonds goes into the production of mining drills, tools for trueing (i.e. leveling and smoothing) grinding wheels, and other tools for shaping, turning, and boring holes into machine parts and other objects made of hard metals and plastics.

When the President of the United States, on July 2, 1940, restricted the exportation of industrial diamonds because they are a strategic war material, this little item in the news of a war torn world escaped the notice of all but a handful of people who were familiar with the facts that made the President's action imperative to this nation's national defense.

The incomparable hardness of the diamond is an absolute necessity to the efficient straight line production of motors and all other interchangeable parts of modern machinery. Either the diamond is used to shape other hard materials (tungsten carbide, silicon carbide, boron carbide, etc.) employed in the accurate forming of machine parts, or else



INDUSTRIAL DIAMONDS IN NATIONAL DEFENSE



Top: In making stainless steel tubing, diamonds are used for tools and in testing hardness.

Diamonds help to keep the rolls of this 4-high finishing stand smooth, so that the stainless steel sheets produced have a superior surface.

By DORUS VAN ITALLIE

President, J. K. Smit & Sons, Inc.

it is used directly in shaping or processing them.

Take away the industrial diamond and we would be pushed back several decades in industrial efficiency. For every machinist now employed to produce war materials, we would have to have ten machinists, and the parts that they would make would no longer be interchangeable but would be individual creations like hand made pottery and other works of art. Our war production schedule would go back to the days of the earliest "horseless carriage" and we would be "duck soup" for any enemy backed by an efficient modern machine industry.

In the modern "Blitzkrieg" type of war which is the inevitable result of highly mechanized industry, mili-



Stainless steel wire is often drawn through diamond dies.



tary equipment must be used with absolute disregard for cost of replacement. It is useless to speculate on the comforts and contentment that could have been bought with the money squandered on destruction. We cannot help but reflect, of course, that the greatest squanderers of wealth are the so-called "have-not" nations who would have us believe that they were forced to attack the civilized world because their people lacked the necessities of life. They could not scrape up enough money to give their people reasonable comfort, but strangely enough, these same people built up armies and air forces so costly that the powerful and wealthy nations felt hesitant to imitate their example.

With a heavy heart and with the greatest reluctance, the democratic nations of the world have found themselves compelled to halt the progress of their fine civil-

Finishing a condenser head plate on a large turntable milling lathe. The synthetic abrasive tool used in this machine is recut, when worn, with the aid of a diamond tool.

Finishing a diamond drill bit used in drilling through hard rock to bring up samples of mineral deposits. With the aid of such tools, and airplanes to bring equipment to remote districts, prospecting can be done today with great speed and convenience.

izations to arm themselves to the teeth, lest the fruits of centuries of progress be trampled under the heavy heels of ruthless conquerors.

In their Blitzkrieg invasion of the defenseless Netherlands, thousands of fully equipped soldiers were dropped behind the lines from military planes, and many more thousands were discharged from planes that actually landed in city streets. Eyewitness accounts of the siege of Rotterdam relate that the transport planes flown in from Germany followed one another in such rapid succession that their pilots did not even bother to land their planes properly. They landed them any old way, cracking up one costly plane after another, because the military advantage of landing another forty or fifty soldiers at that particular minute outweighed the cost of a mere airplane. After a plane cracked up, soldiers were hastily extricated and the plane was pushed into a ditch, to make room for other planes circling overhead waiting for a chance to land.

This disregard for the loss of planes was a luxury which the have-nots could afford because for many long years they had been spending the money they "didn't have" to build up a backlog of warplanes for just this occasion, and because they had "tooled up" years ago for a smoothly functioning continued production of planes which their victims are only now believed to have caught up with.

In this country it may not be until 1942 that the American machine tool industry will have unlimbered its bottleneck to permit the transformation of military equipment from the "on order" to the "on hand" stage. It is a matter of great good fortune that Great Britain and the United States both possess sufficient industrial diamonds to meet defense needs.

When a warplane motor begins to show wear, there is no time for repairing it such as by regrinding valves or cylinders. At least not under war conditions. Details

Continued on page 118



Right: One hundred and fifty footcandles of cool fluorescent daylight are provided over these panel surfaces by means of an 18-inch MAZDA F lamp.

Bottom: These before and after photographs show a light-controlling ceiling compared with a flat white ceiling.

NEW DEVELOPMENTS

IN OFFICE LIGHTING

BY DEAN M. WARREN

GENERAL ELECTRIC COMPANY
Nela Park Engineering Department

OFFICE lighting is fast emerging from the 5 foot-candle enclosing globe stage of yesterday. For efficient operation of the modern office, critical seeing tasks must be performed constantly and at high speed. The effort of seeing is great, but it may be relieved by adequate lighting. Today the demand is growing for a sufficient quantity of light, with a quality of lighting that is appropriate for the long periods of time that people spend in offices.

Quantity of Light

The outdoor worker has some 8000 footcandles on a bright midsummer day, whereas the office worker has only 9½ footcandles, as revealed by a recent survey. It is interesting to note from the accompanying chart, *The Results of Use and Abuse of the Eyes*, that the outdoor worker is singularly free from eye defects, whereas those who work indoors show a progressively higher percentage of defects. These defects reach their peak among draftsmen and stenographers, whose occupations require particularly concentrated vision.



Since the silvered bowl lamp provides its own reflector, the fixture becomes primarily a decorative shield and this can be of any design desired.



The eye is capable of adapting itself to see under illumination values which range from moonlight to sunlight. Under very low illumination the eye does not receive sufficient light to enable it to distinguish detail, and under brilliant sunlight a blinding effect which obliterates detail is also experienced. Between these limits, however, there is a wide range where good vision is possible.

The footcandle values given in the accompanying table represent standards for various seeing requirements in the office. These levels are extremely conservative when compared with levels of illumination that are to be found outdoors. They represent practical steps toward the much higher footcandle levels that appear to be ideal.

Task	Recommended Footcandles
Bookkeeping and Accounting	30
Conference Room	10
Corridors and Stairways	5
Desk Work (Intermittent Reading & Writing)	20
Desk Work (Reading Blueprints & Plans)	30
Rough Drawing and Sketching	30
Filing and Index References	20
Mail Sorting	20
Reception Rooms	10
Business Machines	50-100
Art and Layout Work	30- 50
Drafting	30- 50
Stenographic Work (Prolonged Reading Shorthand Notes)	30- 50

Fifty footcandles of cool fluorescent lighting are provided in this office by six units, each of which is equipped with four 40-watt daylight fluorescent lamps. This replaced an installation of four 300-watt indirect units providing 15 to 20 footcandles. No change was made in the wiring.

Quality of Lighting

Any installation which merely achieves specified standards of footcandles at the sacrifice of comfort, is neither economical nor acceptable. In this respect the presence of direct glare or reflected glare is the principal offender. From present knowledge about the influence of poor seeing upon nervous tension, it has been discovered that glare produces effects as deep-seated as those associated with too little light. There are two kinds of glare—direct and reflected. Direct glare is the most frequent and serious cause of bad lighting. It results, among other things, from unshaded or inadequately shaded light sources located within the field of vision, or from too great a contrast between the bright light source and a dark background, or adjacent surfaces. Direct glare can be avoided by the proper choice and location of equipment.

Reflected glare comes from polished objects, such as glass top or varnished desks or from glossy paper and paint. It is generally impossible to change the character of the work or the nature of the seeing task in order to avoid these potential reflections, but they can be minimized by (1) properly shielding the source, (2) replacing the existing equipment with some type of indirect source, or (3) specifying a source of such dimensions that it is of low brightness.

New Developments in Fluorescent Lighting

The MAZDA F lamp is the newest lighting tool for providing the quantity of light which researches in seeing reveal as necessary for quick and easy seeing.

In common with all electric discharge lamps, this source must have auxiliary control equipment to operate. Specifically-designed control equipment is required for each wattage, each frequency (the lamps are designed to operate on 50 and 60 cycle a-c circuits), and each voltage range. This equipment is available for operating either a single lamp or two lamps. Both correct power factor to better than 90 per cent and thereby permit maximum utilization of the wiring system. For the 30- and 40-watt lamps, the ballasts operating two lamps are more economical than individual ones for each lamp.

In general, MAZDA F lamps lose their usefulness because of decrease in light output before they fail. The rate of depreciation in light output diminishes throughout life; the first hundred hours produce about as much darkening as the following 1000 hours.

During about the first one hundred hours of operation, the light output from fluorescent lamps drops rapidly, often as much as 10 per cent. For this reason, output ratings are based on readings taken after this

initial loss has occurred. Since the output from new lamps is considerably greater than published values, readings taken shortly after an installation has been turned on for the first time may be somewhat higher than the illumination level designed.

The MAZDA F lamp is being used in offices today in equipment mounted flush with the ceiling, in pendant equipment, and in equipment designated as "troffers." The latter is the outgrowth of applying fluorescent lamps to coffer lighting, and of fluorescent lighting to areas with acoustically-treated ceilings. As might be expected, it has its advantages and disadvantages. For example, (1) such a system is not dependent upon the reflection factor of the ceiling, (2) it presents a modern appearance, (3) the troffers may be so designed as to be interchangeable with the acoustical tile, thus achieving flexibility, and (4) has relatively high utilization of the light. On the other side of the ledger, (1) there is a large reflector area to maintain although this is offset somewhat by better depreciation characteristics of this form of lighting, (2) there is a brightness contrast between the ceiling, and (3) shadows are more noticeable than with conventional

indirect systems. On this last point, however, generalized comparisons aren't so good since equipments and installations vary so much and since it seems possible to match every disadvantage of the troffer system with a disadvantage of the conventional indirect system.

Double the Light from Existing Wiring

It has been stated in a preceding article that the fluorescent lamp permits higher levels of lighting with existing wiring, providing power factor correcting equipment is used at the lamp. A case in point is an installation in one of our own buildings at Nela Park. This building was erected in 1913 and wired for 2 watts per square foot with $\frac{3}{4}$ -inch conduit (imbedded in concrete) carrying one circuit per four outlets. The first relighting, done in 1923, improved this to 5 watts per square foot (300 watts per outlet) providing 15 to 20 footcandles and this has been the maximum that could be obtained from the wiring.

The new fluorescent installation utilizes the same wiring, provides 50 footcandles in service and consists of six four-lamp louvered units in offices approxi-



Above: Clerical workers in this office enjoy 45 foot-candles of illumination provided by 40-watt white fluorescent lamps in continuous rows of louvered troughs.



Above Right: Indirect lighting supplemented by direct lighting from a "down-light" unit provides 100 foot-candles on this executive's desk.



Right: Plaster coffers painted white and equipped with 300-watt sivered bowl MAZDA lamps provide 50 foot-candles of soft, well distributed lighting.

mately 14 feet long by 17 feet with a 12 foot ceiling. The lamps are the 40-watt daylight and with their ballasts consume about 50 watts. Hence, a four-lamp fixture requires 200 watts and with 6 units there are exactly the same number of watts per room as with the filament system.

The MAZDA F lamp is being used to provide controlled supplementary lighting for the Better Sight Index. This aid to better office efficiency is so designed that the panels are nearly at right angles to the line of vision and placed so that they can be seen with minimum movement of the head. The lighting is accomplished by an 18-inch fluorescent daylight lamp and the 150 footcandles provided makes the relatively difficult visual tasks of price scheduling, code references, mailing list checks, etc., considerably easier.

New Developments in Filament Lighting

Another source that offers new flexibility in the use of lighting is the silvered bowl lamp. Since the lamp provides its own reflector, the fixture becomes primarily a decorative shield and these shields can be designed to harmonize with new and different concepts of architecture and decoration. The lamps may be used to advantage in many existing types of indirect fixtures, which, through deterioration of reflecting surfaces, inadequate cleaning or original inefficiency are not yielding efficient illumination. They can also be used in overly-bright semi-indirect fixtures to eliminate obnoxious glare. And finally, the use of the lamp cuts maintenance cost since it is only necessary to wipe them occasionally to secure maximum benefits.

Coffer Lighting

This source is being used in offices today in especially designed pendant equipment and in coffers. The difference between a coffer and ordinary indirect lighting, as regards softness of shadows and reflected glare, isn't very great. The two principal advantages of coffers from the illumination standpoint are: (1) the brightness area of the ceiling is concealed from the ordinary field of view; this results in a degree of eye comfort or "optical coolness" which becomes increasingly important at high illumination levels, and (2) the coffer is inherently more efficient.

An objection to the coffer system of lighting is that no direct light reaches the ceiling between coffers and unpleasant brightness contrasts may be the result. On the other hand, if the floor or working plane reflects the light reasonably well enough, light should be redirected

to the ceiling to reduce these contrasts to a point where they are not unpleasant.

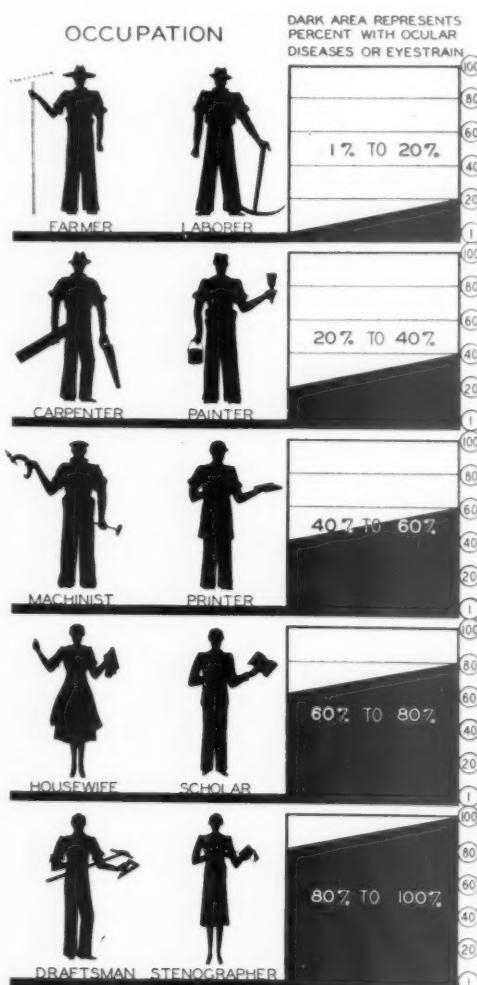
A new development, which might be placed in the same general classification as the coffer is the especially-designed ceiling which controls the direction of the light reflected from it. The primary purpose of this unique ceiling with its matte aluminum finish is to minimize the reflection of light rays out at angles near the horizontal and to increase the percentage redirected into angles between 0 and 60 degrees. Any type of conventional indirect equipment may be used as the light source. The advantage of such a ceiling is that it appears much less bright when viewed from

a distance than does the ordinary flat white ceiling, a factor which contributes much to the "optical coolness" of a 40 to 50 footcandle filament installation. The efficiency of the system in large areas is about the same as for a flat white ceiling—in small areas it may run 20 to 25 per cent more efficient than a flat white ceiling since less light is wasted on the walls.

Downlighting

Another development particularly applicable to private offices is the "downlight." The use of such equipment, properly louvered so that brightness at normal viewing angles is low, enables the executive to secure 100 or more footcandles without objectionable ceiling brightness such as would result were indirect lighting employed. With a system of this type, in fact with any supplementary system, it is necessary that the ceiling and sidewalls be illuminated otherwise the contrast between the brightly lighted work and the relatively dark sidewalls and ceiling is too great for comfort. The necessary contrast-relieving illumination may be provided by indirect pendant equipment, by coves, indirect portables or wall brackets.

There are seven fundamentals of performance usually considered in the purchase of lighting equipment. They are: (1) Efficiency, (2) Absence of Direct Glare and Reflected Glare, (3) Softness of Shadows, (4) Satisfactory Distribution of Light at Various Angles, (5) Pleasing Appearance of Installation, (6) Ease of Maintenance, and (7) Cost. In selecting lighting equipment for the office, the two most important of the seven fundamentals to be considered are direct glare and reflected glare. It is imperative that these be eliminated if high quality lighting is to be obtained.



This chart shows why the "white collar" worker needs all the aid that adequate lighting can give him.

THE BUSINESS YEAR

GOES BACK TO NATURE

The Natural Business Year movement is an escape from regimentation, based on sound principles of accountancy and business management.

THE Natural Business Year movement may reach into the plant in which a Purchasing Agent is employed, or into the businesses of his suppliers or of the customers of his company, or into the maneuvers of his competitors. In any case it influences or outright changes the thinking, the habits and even the functions of every buyer.

By Natural Business Year is meant the annual fiscal period for every company at which it is easiest and most natural to take inventory and to close the books.

By E. L. CADY

This "natural" period is being adopted as a fiscal year by company after company, each company picking its own annual date in accordance with its own needs. There is a Natural Business Year Council directing the movement, and some of the biggest influences in finance are behind it.

The movement itself is of particular interest to Comptrollers, Treasurers, Accountants, and Purchasing Agents who have accounting functions within their control. It has been endorsed by the National Association of Manufacturers, the New York Stock Exchange, and a highly impressive list of accountants' associations and trade associations. William W. Werntz, Chief Accountant of the SEC, said in a recent

Some Companies listed on the New York Stock Exchange, Whose Fiscal Years End in Months Other than December

JANUARY

Abraham & Straus
Allied Stores Corp.
Chicago Railways Co.
Montgomery Ward & Co.
Sears, Roebuck & Co.

MAY

Dow Chemical Co.
Duplan Silk Corp.
General Mills, Inc.
Madison Square Garden Corp.
Pillsbury Flour Mills Co.

AUGUST

Loew's, Inc.
Masonite Corp.
Spencer Kellogg & Sons
Warner Brothers Pictures
Wesson Oil & Snowdrift Co.

FEBRUARY

Beatrice Creamery Co.
California Packing Corp.
Great Western Sugar Co.
Libby, McNeill & Libby
Sheaffer (W. A.) Pen Co.

JUNE

Allied Mills, Inc.
American Agricultural Chemical Co.
American Shipbuilding Co.
A. P. W. Paper Co.
Archer-Daniels-Midland Co.
Colorado Fuel & Iron Corp.
Columbia Pictures Corp.
Hecker Products Corp.
Interborough Rapid Transit Co.
Smith (L. C.) & Corona Type-writers
Starrett (L. S.) Co.
Vick Chemical Co.

SEPTEMBER

Black & Decker Mfg. Co.
Canada Dry Ginger Ale, Inc.
Liquid Carbonic Corp.
Nash-Kelvinator Corp.
Reynolds Spring Co.

MARCH

American Type Founders, Inc.
General Aniline & Film Corp.
Morris (Philip) & Co.
Remington Rand, Inc.
Snider Packing Corp.

JULY

American Sumatra Tobacco Corp.
Distillers Corp.—Seagrams Ltd.
Smith (A. O.) Corp.
United Electric Coal Companies
Waukesha Motor Co.

OCTOBER

Armour & Co.
Brown Shoe Co.
Continental Motors Corp.
International Harvester Co.
Swift & Co.

APRIL

American Car & Foundry Co.
Crown Zellerbach Corp.
Rayonier, Inc.
Thompson-Starrett Co.
Zenith Radio Corp.

NOVEMBER

Douglas Aircraft Co.
Endicott Johnson Corp.
General Tire & Rubber Co.
Manhattan Shirt Co.
Mueller Brass Co.

SUGGESTED FISCAL CLOSING DATES FOR REPRESENTATIVE INDUSTRIES

Aeronautical Supplies	September	30
Air Transportation	April	30
Aircraft Manufacture	November	30
Automobile Manufacture	September	30
Automotive Accessories	July	31
Batteries, Electrical	June	30
Book Publishing	June	30
Breweries	September	30
Candy Manufacture	April	30
Clothing (Work) Manufacture	July	31
Coal Mining	April	30
Container (Paper) Manufacture	April	30
Cotton Goods Manufacture	September	30
Furniture Manufacture	November	30
Gasoline Refining	October	31
Hardware Manufacture	June	30
Hosiery Manufacture	November	30
Insecticide Manufacture	October	31
Jewelry Manufacture	November or March	30 31
Leather Manufacture	October	31
Meat Packing	October	31
Mail Order Houses	January	31
Motion Picture Production	August	31
Office Equipment Manufacture	June	30
Oil Well Supplies	December	31
Paint & Varnish Manufacture ..	November	30
Paper Manufacture	April	30
Pneumatic Machinery Manufacture ..	April	30
Printing Equipment Manufacture ..	August	31
Radio Manufacture	March	31
Road Machinery Manufacture ..	November	30
Rubber Tire Manufacture	October	31
Rugs & Carpet Manufacture	June	30
Sheet Metal Manufacture	March	31
Shipbuilding	June	30
Shoe Manufacture	November	30
Soap Manufacture	June	30
Sporting Goods Manufacture	October	31
Steel & Iron Products	June	30
Tobacco Manufacture	February	28
Toy Manufacture	September	30
Wire & Fencing Manufacture	June	30
Woolen Manufacture	October	31

Other specific recommendations are available upon request

press release: "The advantages to be obtained from the adoption of a fiscal year-end-date which coincides with the lowest point in the annual cycle of operations, are clear and to my mind have never been shown to be outweighed by related disadvantages." Dun and Bradstreet is among those continuing to spend hard cash to further the researches which establish the basic natural business years for various industries.

Whether or not Purchasing Agents as individuals or as a group ought to support this movement, is a question we will not consider here. This article concerns itself with the fact that each buyer must adapt himself to the accumulating effects of the natural business year as that movement grows.

History of Business

To understand the natural business year movement, it is necessary to take a peek at the history of business.

The movement really is new since 1935.

It is true that previous to 1909, every company established its own closing date or fiscal year. But that closing date may not have been "natural" at all. It was apt to be the anniversary of the founding of the company, or of the taking-over by a new management, whether or not that date was a good fiscal one.

In 1909 the Corporate Tax Law forced all corporations to file reports as of closing dates of December 31st. There was considerable furore about this—the "New Deal" is not the first administration to hear kicks about regimentation. But there was less dislocation than there would have been if more of the old closing dates really had been "natural." Many companies merely changed from one unnatural date to another.

In 1913 the Income Tax Law permitted the use of fiscal years other than the calendar year. But habit had been fixed. Relatively few corporations took advantage of the chance to better their methods.

During 1935 the Natural Business Year Council got under way. The objective of the council was to find closing dates which were neither haphazard nor regimented, but really natural. It has found them.

More than 12,000 corporations have adopted natural business year fiscal dates. Among them are dozens of the ones which set the pace and establish the customs for their industries. The movement is growing conservatively, but like the proverbial snow ball there is a continuing increase in the rate of growth.

Why the Movement Grows

The Purchasing Agent is interested in the natural business year movement, first because he is habituated to thinking about the welfare of every part of his company, and second because the movement affects his own job. Both of these viewpoints are found in the basic reasons for the growth of this movement. For there is more behind the natural business year than the fact that powerful influences want it to come into being.

The first reason for growth is that at the natural business year period of any company, the facts which can be presented by the accountant are most accurate, homogeneous and useful. But the Purchasing Agent, too, is a user and a builder of facts. The records he keeps and the predictions he makes from them, are the very finest of accounting. The natural business year can help the buyer with his own facts. **MORE** ➤

Inventory is important to accounting, and the Purchasing Agent either handles the inventory outright or at least prices it. Accountants have told me that any inventory or audit is an imagined stopping of a business which continues actually in motion. It is an accounting stroboscope, focussed on the operations and the figures that flow through the plants and the books. This imagined stoppage is easiest and most accurate for accountant and Purchasing Agent alike when the flow is slowest and the most factors can be brought into static alignment.

The natural business year results in more complete and reliable financial statements. And the Purchasing Agent guides himself by the complete financial position of his company.

At the natural closing period, incomplete transactions within the company may be lowest. The Purchasing Agent therefore has to do the least guessing about the true immediate position of inventory value.

Inventory itself is at its lowest natural point. Therefore it is in the condition which is aimed at when an artificial or unnatural business year is used. And the trouble of taking inventory becomes least for the Purchasing Agent.

Better accounting is available, for accountants are not working day and night as they must if the closing dates are during the all-industry rush period of the first of the year. Accountants with plenty of time do better work. And the purchasing executive finds it easier to get from them those little extra fact pictures which he likes to have.

The accounting picture of the business is reduced to one single annual significant period, instead of having one natural period and one artificial one. The labor of the buyer in working with the accountants is reduced.

Many modern problems of industrial management are difficult or impossible to handle in other than the natural closing periods. Vacations with or without pay for labor, is an example. The Purchasing Agent is affected by these problems, and can help with them best when the natural closing period is used for every practical function.

When the Company Goes Natural

The greatest advantage of the natural business year, is that it is natural. The corresponding and largely intangible disadvantage of the forced business year, is that it is unnatural. And the typical Purchasing Agent, with his hard common sense, is the business world's chief exponent of doing things in the natural way.

When the natural business year is adopted by his own company, the Purchasing Agent finds increased time and opportunity to study the proven results of his functions. Fewer matters are left on the unsatisfactory basis of "we know the results must be right

because the principles are right." And with actual figures taken at the time when figures are clearest, he may prove the right of his department to control, guide or assist more functions of the business.

The tendency of business management is to assign to the purchasing department more and more of the control of inventory, salvage, stores, etc., and to increase his usefulness in matters like finances and taxes. Coming at the time of year when it is most natural for management to plan everything from production and products to business expansion, the natural business year facts help to plan the new or added functions of the Purchasing Agent at the important hour when planning is afoot.

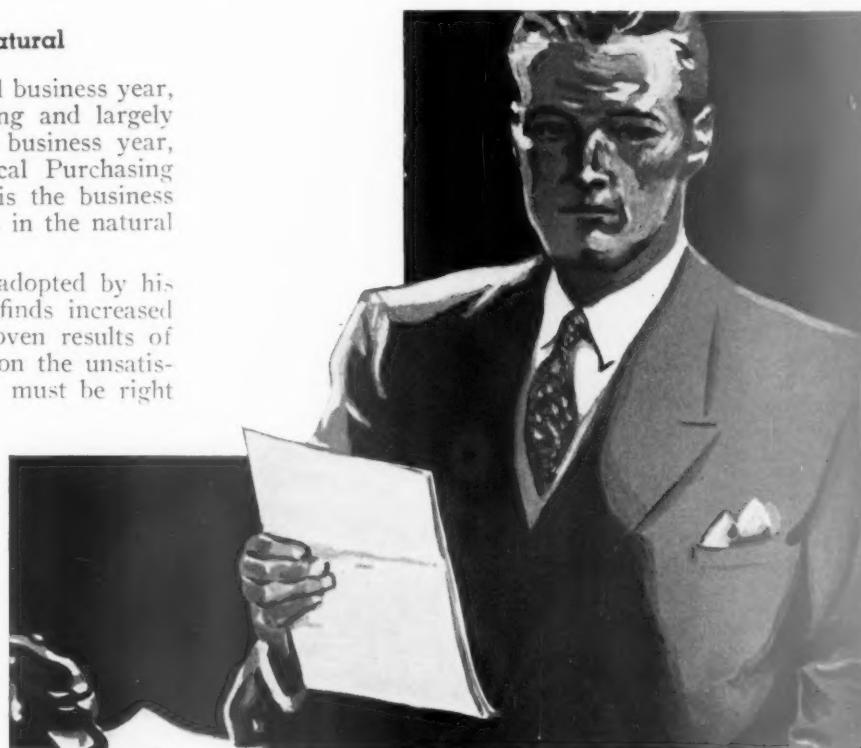
Reports to Management

The purchaser finds that the figures are being taken at the time when the processes of the business are nearest to standing still. This is the most natural time to study the purchasing needs of new processes, equipment, materials, products, markets, and the like. And the reports he makes about this to management, have the advantage of being tied into the company's annual audit. The management can compare purchasing recommendations made now with an audit made now.

Annual audit time is apt to be followed closely by budgeting time. Budgeting leans heavily on recommendations from purchasing. It is done best when all of the plans which must be budgeted are being made, or at the natural business year period.

The Purchasing Agent finds that he can have the time of the very best Sales Engineers around January 1st, when few others want to talk to them. And in these days of defense activity, there is a genuine shortage of available time of many of these men.

He also works most closely with the maintenance and other plant engineers in his company. The natural business year usually coincides with annual overhaul time. The real value of plant equipment, and the needs



• **The establishment of a Natural Business Year for a particular business follows the careful consideration of many time factors. Some of the most important are:**

- 1—The time of least demand for finished goods.
- 2—The time of least availability of raw materials.
- 3—The season least suitable for processing.
- 4—The least availability of seasonal labor.
- 5—The time when style changes have the greatest influence on markets.
- 6—The most convenient time for plant overhaul and annual vacations.
- 7—The time when the most skilled employees will be available for taking inventory.
- 8—The time when accounting figures will have the greatest usefulness to management.
- 9—The time when inventory evaluation will be most accurate, and least dependent on estimate or guesswork.

for purchasing more of it or for revising the lists of supplies for it, are best established then. And at audit time it is easiest to explain these matters to management.

When Outsiders Go Natural

The employer of any given Purchasing Agent may be slow to adopt the natural business year. There are reasons for this, most of them having to do with changed habits in bookkeeping, stockholder relations, etc., and the fact that the purchasing executive and his fellow executives have learned how to compensate for the disadvantages of the artificial business year. But the job of the Purchasing Agent will be affected when outsiders adopt natural business years. And he must study the probabilities.

Those outsiders may be suppliers, customers, or competitors.

When important suppliers "go natural", it may or may not affect the flow of shipments to any company. If a buyer is in one of the industries which give the business backlog to a supplier, then the low point of the supplier's sales will coincide with that of the buyer's demands. But if the low points of buyer and supplier do not coincide, then during his natural closing period the supplier may be shipping from a stock inventory which has been brought to its lowest point, and there may be a demand from the buyer which the supplier cannot fill until production is resumed. Therefore in some cases the buyer must protect his company against the natural business year shutdowns of suppliers.

Annual audit time is price and profit review time. A supplier which adopts a natural business year, may change the seasons of setting up pricing structures accordingly. This may change the season at which a Purchasing Agent should make some of his predictions about future prices.

With changes in prices may come changes in products, sales policies, and the like. The Purchasing Agent, then, is given a new season in which he must learn to anticipate shifts.

Adoption of the natural business year by an impor-

tant customer or field of customers of his company, likewise affects the purchasing job.

Take for example, an important customer who used to close on December 31st, but has shifted to June 30th. In the days of the former closing, there had been a sag in the shipments to that account, starting about November 1st and ending about January 15th, so the customer could have the lowest practicable December 31st inventory. Following the sag would be a surge, lasting through March, to take care of the rush of the customer to rebuild his artificially lowered inventory. Sag and surge both would be reflected in the finished stock inventory of the supplier in question, and would change the pictures of the relations of orders on hand to goods in process and the like.

The Purchasing Agent of the supplier, then, would have his choice of changing his own commitments to suit the orders on hand, or of outguessing during the sag the probable needs for the surge. But with the customer's closing date changed to June 30th, there is no such December sag and surge, but just a natural tapering-off of sales at the natural period for this in May or June.

There are plenty of headaches for the Purchasing Agent in the natural business year. Principal among them is the fact that the date usually is chosen to suit accounting, finance and sales functions, and that any relation to purchasing advantages, living or dead, is strictly a coincidence. But the Purchasing Agent is used to changing his functions and his timing to suit new conditions, and will cope with this change too.

As compensation, he gets rid of headaches that he has learned to take for granted around the first of the year.

The natural business year has the advantage of producing more and better facts, and the Purchasing Agent likes facts. There are disadvantages, but they are accountant's disadvantages and seldom within the realm which the buyer controls. The movement is a growing one. And from the point of view of the purchasing man, there is no need to discuss whether the natural business year is coming along too rapidly or slowly. The movement affects the buyer's job, whether or not his company joins it, and he must keep abreast of it accordingly.

SPECIFICATIONS FOR SERVICE . . .

By
R. L. STOUGHTON
Production and Purchase
Manager
Lee Spring Company

The complete specification considers a product's use, and not only the dimensions and composition. Here's an opportunity for Purchasing Agents to find and procure greatest ultimate value in their buying.

CHANGING trends in buying habits should be watched by all of us if we are to render a service of leadership to our company. Sometimes these trends are barely noticeable at the start, but as they develop a wider and wider acceptance because of some intrinsic value we are apt to think, "So simple and yet I never thought of it that way before".

Such a trend is noticeable in specifications. At present it is little more than a ripple but it seems to be growing larger. It has merit and is applicable in several fields. If the ripple of acceptance continues to expand, will the Purchasing Agent receive credit for leadership in introducing the thought into his company or will another branch be the one to incorporate the thought in company specifications and hand it to the Purchasing Agent to buy under?

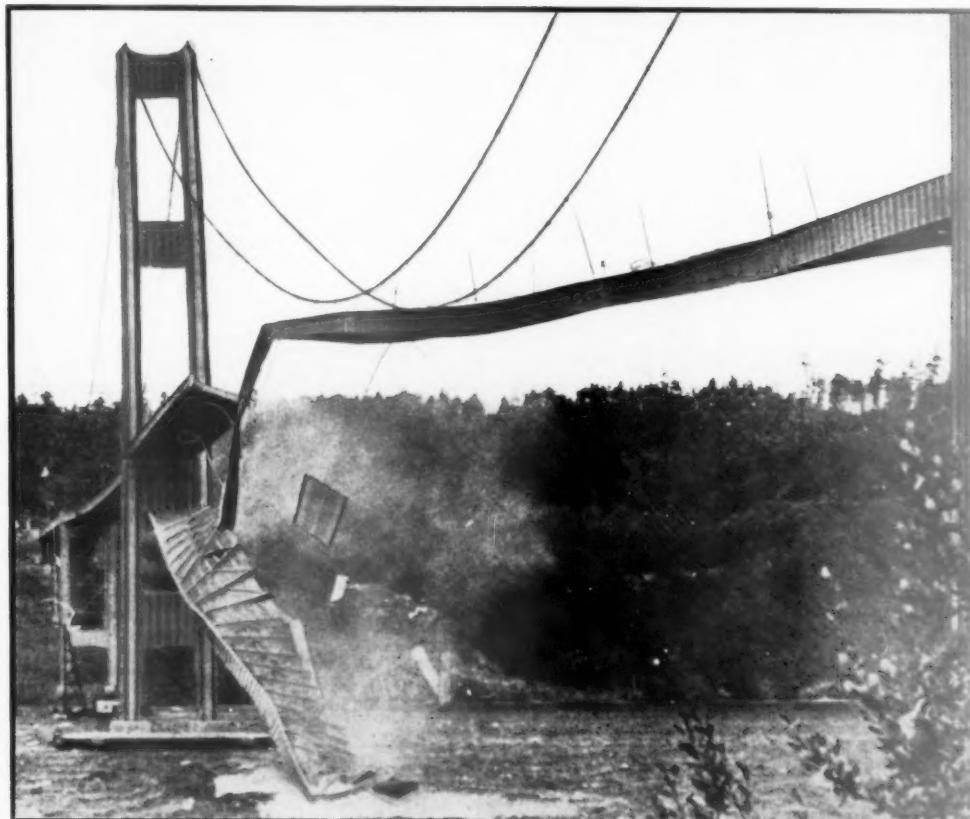
We are familiar with that type of specification wherein every dimension of a device is given in greatest detail and to which a statement is added giving the result which the device will be expected to accomplish

in service, such as horsepower in a motor or speed in a boat. Often acceptance is contingent upon accomplishment under trial. For the sake of clarity, let us call these whole specifications. In addition to the usual requirements or limitations, a whole specification includes a description of the way in which the specified material will be used, in as great detail as its importance demands.

Many spring specifications, for instance, read "Material—Steel" without any mention of the service which will be expected of the product. This leaves the selection of grade entirely up to the supplier. It so happens that steel includes a multitude of kinds and grades. U. S. Navy Specification 47S4E Int., dated January 20, 1939, lists a dozen different kinds of spring steels and this does not include all of them by any means. Without a description of use, the supplier is just playing blind man's bluff in attempting to make a wise selection. If the operating conditions were described

Continued on page 11

The 6½-million dollar Tacoma Narrows Bridge met every specification except that of use, and fell to the bottom of Puget Sound after four months. The same thing is happening every day, on a smaller scale, with scores of industrial products and materials.



THE MARKET PLACE



First - of - the - month quotations
for carloads or mill shipments,
with comparative prices quoted
one month ago and one year ago

ACIDS

	Feb. 1 1940	Jan. 1 1941	Feb. 1 1941
Acetic, 28%, cwt.....	2.23	2.23	2.23
Muriatic, 18 deg., cwt.....	1.50	1.50	1.50
Nitric, 36 deg., cwt.....	5.00	5.00	5.00
Oxalic, Works, cwt.....	10.75	10.75	10.75
Phenol, Works, cwt.....	14.25	14.25	14.25
Sulphuric, 66 deg., ton.....	16.50	16.50	16.50



BUILDING MATERIALS

Brick, N. Y. dock, per M.....	12.00	12.00	12.00
Cement, f.o.b. plant, bbl.....	2.15	2.15	2.15
Glass, single B, per box.....	2.70	2.70	2.70
Lime, per bbl.....	2.75	2.85	2.85
Nails, wire, per keg.....	2.55	2.55	2.55
Oak flooring, per M. ft.....	71.00	83.00	83.00
Southern pine, K.C., per M. ft.....	25.16	32.86	29.06 ↓



CHEMICALS

Alcohol, denatured, gal.....	.31½	.32½	.32½
Alum, potash, cwt.....	3.75	3.75	3.75
Alumina Sulf., Comm., Works, cwt.....	1.15	1.15	1.15
Ammonia, aqua, 26 deg., drums.....	.02½	.02½	.02½
Arsenic White, cwt.....	3.00	3.50	3.50
Red, cwt.....	18.00	nom.	nom.
Barium Chloride, ton.....	77.00	77.00	77.00
Carbonate, ton.....	56.50	56.50	56.50
Benzol, pure, gal.....	.16	.14	.14
Borax, powd., ton.....	48.00	48.00	48.00
Chlorine, cwt.....	1.75	1.75	1.75
Formaldehyde, lb.....	.05½	.05½	.05½
Glycerine, drums, lb.....	.12½	.12½	.12½
Lead acetate, white, broken, cwt.....	11.00	11.00	11.00
Nickel sulphate Double.....	.13	.13	.13
Single.....	.13	.13	.13
Potash Caustic, solid.....	.06½	.06½	.06½
Permanganate.....	.18½	.20	.20
Sal Ammoniac Gran, white, cwt.....	4.50	4.50	4.50
Gran, gray, cwt.....	5.75	5.75	5.75

COAL & COKE

Anthracite, stove, mines.....	6.25	6.25	6.25
Bituminous, Cleaf, mine run.....	2.60	2.50	2.50
Beehive Coke, Connellsville.....	5.00	5.00	5.00
By-product Coke, Newark.....	11.38	11.85	11.85

FERTILIZERS

Muriate potash, 80-85%, per unit K2O.....	.53½	.53½	.53½
Sulphate potash, 90-95%, bags.....	36.25	36.25	36.25
Nitrate soda, bulk.....	27.00	27.00	27.00
Sulphate ammonia, dom. bulk.....	28.00	28.00	29.00 ↑
Steamed bonemeal, 3 and 50, per ton.....	32.00	32.50	32.50

GRAINS

Barley, malting, bu.....	.70	.75½	.75½ ↓
Corn, No. 3, yellow, bu.....	.58½	.62½	.60½ ↓
Oats, No. 2 white, bu.....	.43½	.40	.37½ ↓
Rye, No. 2, Western, bu.....	.84½	.65½	.62½ ↓
Wheat, No. 2, hard winter, bu.....	.96	.83½	.77 ↓
Flour, spring patents, 196 lbs.....	6.20	4.85	4.75 ↓

HIDES

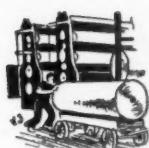
Light native cows, lb.....	.13	.13½	.13 ↓
Heavy native steers, lb.....	.12½	.13	.13½ ↑
Calfskins, 5-7 lbs, per skin.....	1.80	1.75	1.75

	Feb. 1 1940	Jan. 1 1941	Feb. 1 1941
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	Feb. 1 1940	Jan. 1 1941	Feb. 1 1941
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IRON & STEEL

Pig iron, foundry No. 2.....	23.00	24.00	24.00
Pig iron, basic, valley.....	22.50	23.50	23.50
Cast iron pipe, New York.....	53.00	52.20	52.20
Forging billets, Pittsburgh base	40.00	40.00	40.00
Sheet bars, Pittsburgh base....	34.00	34.00	34.00
Wire rods, Pittsburgh base....	43.00	40.00	40.00
Cold rolled sheets, cwt., Pittsburgh base.....	3.20	3.05	3.05
Hot rolled annealed sheets, cwt., Pittsburgh base.....	2.10	2.10	2.10
Cold rolled strips, cwt., Pittsburgh base.....	2.95	2.80	2.80
Hot rolled strips, cwt., Pittsburgh base.....	2.10	2.10	2.10
Tin plate, cwt., Pittsburgh base	5.00	5.00	5.00
Bars, cwt., Pittsburgh base....	2.10	2.15	2.15
Shapes, cwt., Pittsburgh base....	2.10	2.10	2.10
Bright wire, cwt., Pittsburgh base	2.60	2.60	2.60
Ground shafting, cwt., Pittsburgh base.....	2.70	2.65	2.65
Rails, ton, Pittsburgh base....	40.00	40.00	40.00
No. 1 heavy melting scrap, ton, Pittsburgh	18.50	23.00	21.00 ↓



PAPER

News, roll, ton	50.00	50.00	50.00
Book, M. F., cwt.....	6.25	6.40	6.40
Wrapping, northern, cwt.....	5.00	5.25	5.25
Wrapping, southern, cwt.....	4.00	4.25	4.25
Wrapping, manila jute, cwt.....	8.25	8.25	8.25
Chip board, No. 1, ton.....	45.00	30.00	30.00
Wood pulp, mech., ton.....	32.00	34.00	34.00
Wood pulp, sulph., No. 1, cwt..	2.50	3.17½	3.17½



PETROLEUM

Crude, Mid-Continent	1.02	1.02	1.02
Crude, Penna.	1.95	1.59	1.89 ↑
Gasoline, 65 oct.....	.06½	.05½	.05½
Bunker Oil C.....	1.15	1.15	1.25 ↑
Kerosene, 41-43 grav.....	.056	.052	.053 ↑
Penn. bright stock, light, 25 P.T.	nom.	.19	.21 ↑
Penn. cylinder oil, 600 flash....	nom.	.17½	.18 ↑



RUBBER

Smoked sheets18½	.20½	.19½ ↓
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TEXTILES

Cotton middlings, Galveston...	.1042	.097	.098 ↑
Cotton yarns, 22s.....	.26	.28	.28
Print cloths, 38½", 64 x 60....	.05½	.05½	.05½
Sheetings, 37", 48x48.....	.05½	.06½	.06½
Wool, fine combing, ½-blood..	.98	1.02	1.02
Worsted yarns, French 2-40s...	1.87½	1.80	1.80
Worsted yarns, English 2-40s..	1.85	1.82½	1.82½
Silk, Japan, double extra cracks	3.30	2.52	2.53 ↑
Rayon, viscose, 150, 40s.....	.53	.53	.53
Burlap, 10½-oz., 40".....	.085	.0815	.0835 ↑
Hemp, Manila.....	.07½	.07½	.06½

METALS, NON-FERROUS

Aluminum, virgin ingots.....	.20	.17	.17
Antimony, American, spot....	.14	.14	.14
Copper			
Electrolytic .....	.11½	.12	.12
Casting .....	.11½	.12½	.12½ ↑
Lake .....	.12	.12	.12
Chromium, 97%, spot.....	.85	.84	.84
Lead, E. St. Louis.....	.051	.0535	.0535
Nickel, ingot .....	.35	.35	.35
Quicksilver, flask.....	180.00	163.00	167.00 ↑
Silver, bars, N. Y., per oz.....	.34½	.34½	.34½
Tin, Straits, spot.....	.455	.501	.5045 ↑
Zinc, E. St. Louis.....	.055	.0725	.0725

METAL PRODUCTS

Copper, wire, bare, cwt.....	14.625	15.375	15.375
Yellow brass sheets, high.....	18.40	19.23	19.48 ↑



NAVAL STORES

Turpentine, gal.....	.405	.44	.49½ ↑
Rosin, Grade B, cwt.....	2.11	2.00	2.20 ↑

PAINT MATERIALS

White lead, dry, basic, car- bonate .....	.07	.07	.07½ ↑
Carbon black .....	.0255	.03075	.03075
Shellac, orange .....	.20	.17	.16 ↓
Linseed oil .....	.106	.088	.097 ↑

Among the ASSOCIATIONS

BOFFEY MEMORIAL AWARDS

The winners in the 1940 Students' Contest for the Boffey Memorial Awards of the N.A.P.A. have been announced as follows:

First Prize, \$200: John G. McLean of Cambridge, Mass., "A Quantitative Approach to the Determination of Purchase Quantities."

Second Prize, \$150: Henry S. Fauvre of Rochester, N. Y., "Budgets and the Purchasing Department."

Third Prize, \$100: Charles W. Clarke of Los Angeles, Cal., "Manufacture or Buy?"

Fourth Prize, \$50: Albert Farmer of Lakewood, Ohio, "Responsibilities and Prerogatives of the Purchasing Agent in the Determination and Maintenance of Quality Standards."

The 1940 awards represent a clean sweep for the Students of the Graduate School of Business Administration, Harvard University, which has dominated the awards in previous years but never so completely.

The committee in charge of the contest was F. Albert Hayes of the American Hide & Leather Co., Boston, (Chairman); Silas P. Rich, Board of Education, Seattle; George H. Cole, Alabama Power Co., Birmingham; W. G. Thomas, Duke Power Co., Charlotte, N. C.; James M. Knowles, Consolidation Coal Co., Fairmont, W. Va.; Robert C. Kelley, Converse Rubber Co., Malden, Mass.; and Fred C. Irwin, Canada Wire & Cable Co., Ltd., Toronto.

Preliminary judging committees were: (1) Silas Rich, Seattle Board of Education (Chairman); W. H. Crouch, Snoqualmie Falls (Wash.) Lumber Co.; and Roy C. Hull, E. I. du Pont de Nemours & Co., Du Pont, Wash. (2) George H. Cole, Alabama Power Co., Birmingham (Chairman); H. C. Green, Republic Steel Corp., Birmingham; and L. C. Teague, Tennessee Coal, Iron & Railroad Co., Birmingham. (3) W. G. Thomas, Duke Power Co., Charlotte, N. C. (Chairman); G. C. Eichhorn, Vick Chemical Co., Greensboro, N. C.; and O. G. Sawyer, Duke University, Durham, N. C. (4) James M. Knowles, Consolidation Coal Co., Fairmont, W. Va. (Chairman); Howard Livezey, Railway & Industrial Engineering Co., Greensburg, Pa.; and William McKenna, Hanlon-Gregory Co., Pittsburgh.

The final judging committee was Robert C. Kelley, Converse Rubber Co.,

Malden, Mass. (Chairman); Ralph D. Berry, Davol Rubber Co., Providence; and William G. Morse, Harvard University, Cambridge, Mass.

Rules Are Changed

For the 1941 contest, it has been determined to make one major change, in that two separate competitions will be conducted, for (a) undergraduate students, and (b) graduate students in business administration.

The rules governing entrants, papers and procedure for judging in the students' contest have been developed gradually over a period of years. The change now made effective for the 1941 contest—separating it into two classes of entrants—has had careful consideration over the past two years.

Graduate students in business administration from topflight universities have consistently carried off a majority of the contest prizes. Their additional education plus, in many instances, business experience has made that logical and to be expected. Graduate students, on the other hand, might well be expected to furnish valuable original thought and research in the papers presented.

Including both graduate and undergraduate students in a single competition has had a tendency to discourage entries from undergraduates of many colleges and universities. We are interested in securing the widest possible participation by undergraduates as well as graduate students. We would like to have contest papers from every important institution and all sections of United States and Canada. The 1941 rules make that possible.

The following announcement offers two separate contests with an equal number and value of awards. This arrangement gives a true indication of our desire to make the contest attractive to all students, with equal opportunity for all to win.

The change of rules was recommended informally at the San Francisco Convention in 1939 by Prof. Howard Lewis of Harvard Business School. The contest committee, then headed by Fred W. Russe of St. Louis, passed it along to the 1940 committee headed by George W. Aljian of San Francisco.

Dean Jackson of Stanford, Professor Ross of California, Professor Reyer of Louisiana, Professor Gordy of Michigan and other leading educational executives were consulted before the

recommendation was put into final form as now presented.

The change has been approved by the N.A.P.A. executive committee and complete rules governing the 1941 competition are announced as follows:

1941 STUDENTS' CONTEST

Sponsored by

NATIONAL ASSOCIATION OF PURCHASING AGENTS

Object: This student contest and award commemorate the contributions of L. F. Boffey to the purchasing profession. Six prizes of \$100.00 are offered for the best manuscripts on Procurement prepared by qualified students under the following rules:

Subject

1. All manuscripts must deal with the subject of Purchasing or a specific phase of purchasing for industrial, governmental or educational institutions. This excludes buying for resale.

Form of Manuscripts

2. Each manuscript must be typed on one side of the sheet, double spaced, on white paper 8½ by 11 inches. Its length shall not exceed fifty pages, including charts and forms.

3. Each competitor must inscribe his manuscript with an assumed name and the group in which the manuscript is entered, and in an accompanying plain, sealed envelope, addressed to the Secretary of the National Association of Purchasing Agents, 11 Park Place, New York, N. Y., give his real name, school and home addresses, school status as an undergraduate or graduate student of business administration at the time the article was prepared. The accompanying envelope must also be identified as belonging to the manuscript by the inscription of the assumed name on the outside of the sealed envelope.

Those Eligible to Compete

4. This competition is open only to regularly enrolled, full-time students in any recognized college or university having a School of Commerce or College of Business Administration. Manuscripts shall be entered in only one of the following groups:

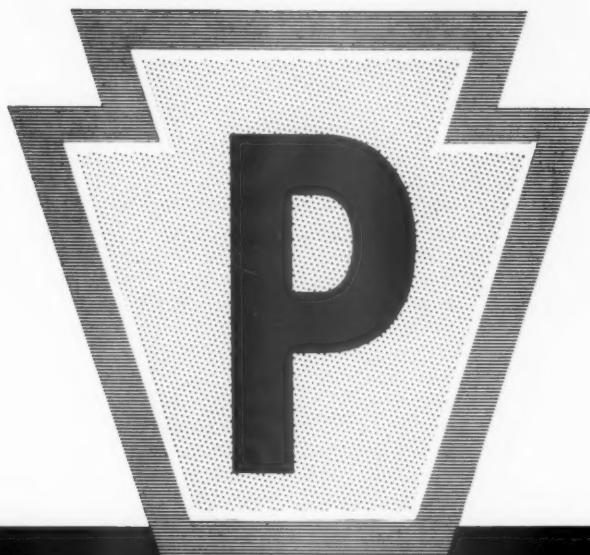
Group A—Manuscripts prepared by undergraduate students.

Group B—Manuscripts prepared by graduate students in business administration.

Members of this Association and those eligible for membership may not qualify.

Ownership of Manuscripts

5. All manuscripts submitted in either group for this competition shall be



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Cracking Still Tubes . . . Pressure Piping . . . Boiler Tubes
Locomotive Tubes . . . Stainless Steel Tubes
Mechanical Tubing . . . Seamless Merchant Pipe

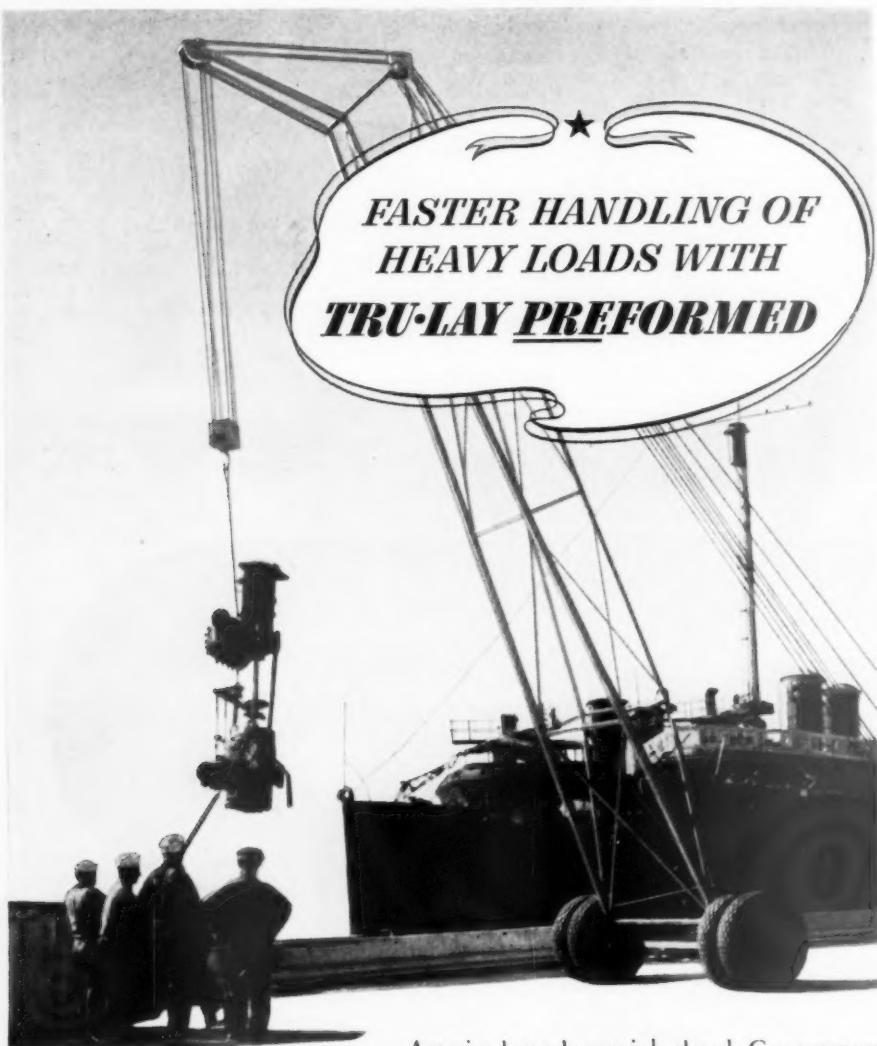
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Preformed Wire Rope to shoulder a share of the burden.

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In thousands of equally serious and difficult jobs, in scores of industries, Tru-Lay Preformed Wire Rope is contributing notable mechanical performance to the point that Tru-Lay virtually ends executive worry about wire rope.

Men shouldering heavy responsibilities turn instinctively to Tru-Lay Preformed Wire Rope and the other 137 ACCO Pedigreed Products. Below are listed some of the essential things we make for INDUSTRY, AGRICULTURE and TRANSPORTATION.



CHAIN—Weed Tire Chain
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Tru-Loc Fittings—Tru-Lay Control Cables
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BRAKES—Tru-Stop Brakes for Trucks & Buses
AMERICAN CABLE DIVISION

CUTTING MACHINES—Wet Abrasive
Cutting Machines—Nibbling Machines
ANDREW C. CAMPBELL DIVISION

In Canada—Dominion Chain Company, Limited • In England—The Parsons Chain Company, Ltd., and British Wire Products, Ltd.

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come the property of the National Association of Purchasing Agents for use as the Association may decide to make without compensation to the author.

Time of Competition

6. Manuscripts must be placed in the office of the National Association of Purchasing Agents, either by messenger or by registered first-class mail, not later than noon on August 1, 1941.

Awards and Prizes

7. The Boffey Memorial Students' Contest Committee will appoint competent judges who shall be members of the N.A.P.A. and their decision shall be final. These judges will award prior to December 31, 1941, three prizes of one hundred dollars each (\$100.00) in Group A, and three more of one hundred dollars each (\$100.00) in Group B to the authors of the manuscripts which in the opinion of the judges are the best of those submitted in their respective groups when judged from the standpoint of the "Rules for Judging" shown below.

RULES FOR JUDGING

8. All committees, whether preliminary or final, will judge each paper upon the following bases:

(a) Thought—70 points

There should be a logical development of the theme of the paper, so organized that the reader may easily follow the line of reasoning. Emphasis will be placed upon:

1. Originality of thought or novelty of thought in discussing the purchasing function, or subjects related directly to it.

2. The use of source material obtained outside of textbooks and classrooms, as contrasted with the mere compilation of facts, or the mere restatement of the opinions of others.

3. Evidence that independent study and research has been utilized.

4. Aptness in illustration and in method of presenting charts and data.

Purely expository papers in the nature of descriptions of function or method should not be submitted. However, such papers will be considered eligible if arguments for or against a procedure or method are included as a basic part of subject development. The dual nature of subjects presented should be recognized by: (1) presentation of evidence both pro and con; (2) a careful weighing of the arguments presented; (3) a clear statement of the conclusions based upon the arguments presented.

The decision on the merits of a paper is to be entirely separate from the question of whether or not the particular judge agrees with the conclusions reached. In other words, if a student starts out with a definite hypothesis, presents convincing arguments, carefully digests such arguments, and reaches a



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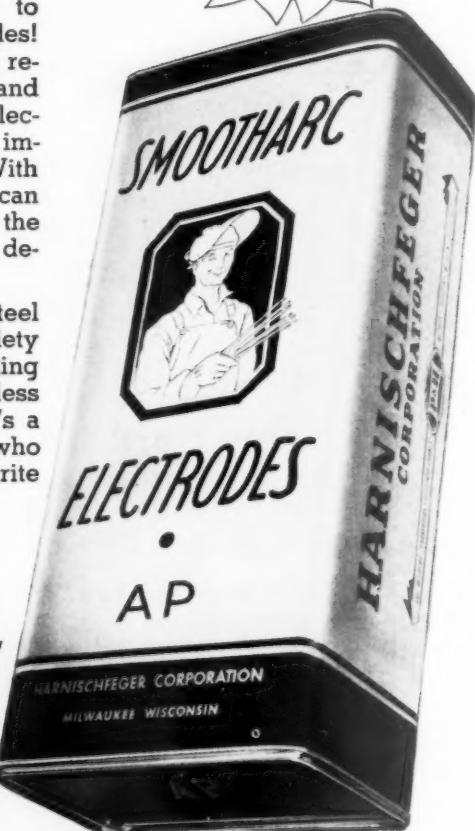
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logical conclusion, such paper will be given a good rating regardless of whether the conclusion fits in with the theories or dogmas of the judge.

(b) English and Composition— 30 points

Emphasis should be placed upon: Correct spelling and punctuation. Proper sentence and paragraph structure.

The source of all data used should be clearly indicated by proper notations on charts or tables; quotations from published sources, or ideas obtained from others, should be acknowledged by appropriate footnotes. It is not sufficient to append a bibliography; specific textual or footnote references should be used throughout the manuscript.

Manuscripts will be excluded if: (1) the group in which they are entered is not shown; (2) entered in the wrong group; and (3) the author's true name or educational institution in which he is enrolled is revealed in any way.

SUBJECTS WINNING PREVIOUS CONTESTS

Listed below are the titles of prize winning papers. They illustrate the scope of the contest and may be a helpful guide for interested students.

1940

A Quantitative Approach to the Determination of Purchase Quantities.

Budgets and the Purchasing Department.

Manufacture or Buy.

Responsibilities and Prerogatives of the Purchasing Agent in the Determination and Maintenance of Quality Standards.

1939

Commodity Price Forecasting by the Purchasing Executive.

The Effect the Guffey Act Has Had and Will Have on the Industrial Buyer or Purchasing Agent.

The Purchase Budget.

An Appraisal of Speculative Purchasing.

1938

A Critical Analysis of Employee Purchasing.

The Law of Agency and the Purchasing Officer.

Inventory Control Through Records. Purchasing Versus Manufacturing.

NEW OFFICERS OF THE CENTRAL ONTARIO BRANCH

Officers for 1941 have been chosen by the Central Ontario Branch, Hamilton Association, as follows:

Chairman: F. E. Mason of Preston Noelting Co., Ltd., Stratford.

Past Chairman and Director of National Affairs: C. W. P. Curzon of Cluett Peabody Co., Ltd., Kitchener.

Vice Chairman: H. L. Anderson of



IT is common sense to protect workers from injury in the plant. Yet only about 10% of the absences in industry are due to accidents and occupational disease. The other 90% are due to ordinary illnesses. And chief of these are the communicable diseases which can spread so fast where workers do not have proper facilities for washing up.

Moreover, inadequate washrooms may hurt industrial relations. American workers today enjoy high standards of sanitation in their homes. Lower standards in the plant may cause discontent and unrest.

The Scott Washroom Advisory Service offers skilled assistance to firms wishing to modernize their washrooms for better hygiene, more comfort, greater economy. It will suggest ways to improve traffic conditions and increase good will. Write for details—no obligation!

New "Soft-Tuff" ScotTissue Towels. A keen weapon against the spread of communicable disease is the provision of clean, individual "Soft-Tuff" ScotTissue Towels. A Scott Duralose product, these amazing new towels are far tougher in use. Hence they go farther, are economical to use throughout the plant. They are softer, too—ideal for executive washrooms. For further information about these remarkable new towels, write: Scott Paper Company, Chester, Pa.



NEW Soft-Tuff ScotTissue TOWELS

"FOR CLEAN HANDS IN BUSINESS"

Copr., 1941, Scott Paper Co. Trade Marks "Scot Tissue," "Duralose" Reg. U. S. Pat. Office. Trade Marks "Soft-Tuff," "Washroom Advisory Service" Reg. App. for.

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For Buyers of Taps & Dies:



INCREASED plant facilities! New buildings; New and improved machines; plus an even closer inspection of finished product; assure you the same expert craftsmanship that has led a host of nationally-known manufacturers to specify WINTER TAPS for all their tapping jobs.

WRITE FOR CATALOG 18



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A division of
THE NATIONAL TWIST DRILL & TOOL COMPANY
Detroit, Michigan

Dominion Electrohome Industries, Ltd.
Secretary: Albert Brubacher of Breithaupt Leather Co., Ltd.

Executive Committee: H. E. Lachman of Dominion Life Assurance Co., Waterloo; N. W. Zinn of Galt Malleable Iron Co., Ltd., Galt; A. V. Haller of Blue Top Brewing Co., Ltd., Kitchener; K. B. Hales of Federal Wire & Cable Co., Ltd., Guelph; R. J. Nesbitt of Beaver Furniture Co., Ltd., Kitchener; and G. A. Huck of Huck Glove Co., Ltd., Kitchener.

1 1 1 SAGINAW VALLEY OFFICERS

The Saginaw Valley Association has elected the following officers for 1941:

President: Ed. Harris of Bay City.

Vice President: John R. Clayton of Saginaw.

Secretary: Lawrence Smith of Saginaw.

Treasurer: G. W. Cooke of Bay City.

National Director: Thomas H. Plater of Saginaw.

1 1 1 DEXTER NAMED VICE PRESIDENT

Oakley W. Dexter, Purchasing Agent of the Crown-Zellerbach Corp., San Francisco, has been chosen to represent District No. 1, N.A.P.A., as Vice President on the national executive committee, succeeding William C. Hubner, who has resigned on account of poor health. Mr. Hubner, who went through the exacting schedule of the San Francisco convention on crutches, following a severe automobile accident, has again been hospitalized for further operations made necessary by that injury.

1 1 1 JANUARY 3

PORTLAND—Luncheon meeting of the *Oregon Association*, at the Mallory Hotel. Motion picture, "The Manufacture of Wire Rope," shown through courtesy of the Bethlehem Steel Co.

1 1 1 JANUARY 6

HOUSTON—Luncheon meeting of the *Houston Association*, at the Rice Hotel. Discussion of N.A.P.A. releases, led by F. T. Fendley, National Director.

1 1 1 JANUARY 7

TULSA—Dinner meeting of the *Tulsa Association*. New officers, as previously announced in these columns, took over their duties at this meeting. D. H. Pratt, Commissioner of Finance and Revenue, and J. T. Lantry, City Purchasing Agent, explained the status and procedure of the municipal purchasing department.

OAKLAND—Luncheon meeting of the *East Bay Group, Northern California Association*, at the Lake Merritt Hotel.



An Anchor Fence Provides Complete Protection with Minimum Expense for Guards or Policing

Saboteurs and spies are probably studying your plant protection right now—looking for *all* opportunities to destroy or hinder Defense work.

How long has it been since *you* made a study of your plant protection? Have you applied the two outstanding rules of sabotage protection to your plant? First—have you raised a "Wall of Steel"—a strong, rugged Anchor Fence—around your plant to protect you from *outside* saboteurs? Secondly—have you raised similar barriers *inside* your plant around your power station, transformer installations, chemical storage, fuel supply to make certain that only trusted and selected employees can have access to these vulnerable points? Remember, there *may* be potential saboteurs on your payroll now!

Act now. Be ready with a positively effective plan for protecting your Government Contract Work.

Send for the Anchor Fence Engineer

He'll gladly show you how an Anchor Fence installation can protect your plant from both *inside* and *outside* saboteurs—with a minimum of expense for guards and policing. He'll show you how an Anchor Fence can be quickly installed, yet can be moved without loss in case of plant expansion. He'll give you the benefits of Anchor's long experience and study in complete fence protection in a wide variety of industries.



AN ANCHOR FENCE ENGINEER will gladly help you plan complete protection for your plant. Write or wire today to the: ANCHOR POST FENCE CO., 6615 Eastern Ave., Baltimore, Md.

FOR more efficient HANDS

... AND Greater Man-Hour Productivity!



lessens work-efficiency and can cost real money for compensation.

LANOKLEEN

is a product to intrigue a keen P.A.'s interest. Not because it is "lowest priced," but because it represents a net economy—plus advantages as above outlined . . . Because Lan-O-Kleen is a light fluffy product you get so many more washings

per pound that its extra quality benefits cost you nothing. It is a cormeal soap IMPREGNATED WITH SKIN-EMOLlient LANOLIN . . . No sand grit, no pumice, no harsh causticity . . . A GENTLE-acting soap of HIGHEST cleansing efficiency.

DO YOU DISINFECT YOUR CUTTING OIL TO PREVENT OIL DERMATITIS?

Wescol—created in collaboration with prominent Safety Engineers—is a most efficient product for the purpose. It is added to the cutting oil without affecting its useful qualities in the slightest degree. Literature on request.

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WEST DISINFECTING COMPANY

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I am interested in your FREE TRIAL offer of a Dispenser and sufficient LAN-O-KLEEN to test out for 2 to 3 weeks in one department. Please get in touch.

Name of Individual

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Street & City

Speaker: Sergeant Hugo R. Pflug of the City of Oakland Traffic Department, "Enforcement of Traffic Regulations."

1919 JANUARY 9

LOS ANGELES—Dinner meeting of the *Los Angeles Association*, at the Elks Club. Speaker: Dr. Clayton Carcus, Professor of Foreign Trade, University of Southern California, "Hemispheric Solidarity."

SPRINGFIELD, MASS. — Nineteenth annual Ladies' Night dinner dance of the *Western Massachusetts Association*, at the Hotel Kimball. R. M. Price was general chairman of the committee, John Triblehorn in charge of ticket sales, and W. Lee Costigan master of ceremonies.

BIRMINGHAM—Luncheon meeting of the *Birmingham Association*, at the Redmont Hotel. Speaker: F. F. Newcomb, State Director, Division of Finance and Statistics, National Youth Administration, "The Organization and Operation of the National Youth Administration."

CHICAGO—"Past Presidents' Night" dinner meeting of the *Chicago Association*, at the Hotel Sherman, inaugurating the silver anniversary year of the association. Many of the leaders of the association during its quarter century of history were present as guests of honor. Speaker: George A. Renard, Executive Secretary of the N.A.P.A., "From One P.A. to Another."

SAN FRANCISCO—Luncheon meeting of the *Northern California Association*, at the Palace Hotel. Speaker: Lt.-Col. Rhys Davies, D.S.O., "The Battle of Britain."

TACOMA—Monthly meeting of the *Washington Association*, attended by members from Bellingham, Everett, Olympia, Seattle and Tacoma. Herbert H. Clarke of the Wheeler Osgood Sales Corp., Tacoma, was in charge of arrangements. The program included plant inspection trips at the Carstens Packing Co. and the veneer plant of Wheeler Osgood Sales Corp.; a bowling tournament; and a dinner and business meeting at the University-Union Club. Principal speaker at the evening meeting was Roger Mastrude, graduate of the College of Puget Sound, recently returned from a year of study at the Royal University, Budapest, who discussed "Hungary Under the Nazi." Motion pictures were shown of the breakup of the Tacoma Narrows Bridge. A forum on "Purchasing Problems Under a Defense Economy" was led by Harry Miller of Electrical Products Consolidated and Robert P. Morton of W. P. Fuller Co.

SALT LAKE CITY—Dinner meeting of the *Utah Association*, at the Hotel Utah. William L. Park, National Director, led a discussion of economic

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STANLEY CONTOUR GRINDER, priced only \$69.50, handles scores of accurate grinding operations. For making templets, grinding dies, finding blanks, correcting hardening distortion . . . handling regular production.



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NEW! STANLEY NO. 153 GRINDER, with $\frac{3}{8}$ h.p. 18,000 r.p.m. Universal motor, ideal for either free-hand or tool-post grinding. It is well balanced for easy handling, fluted for comfortable grip, weighs only 5 lbs.



This Stanley Grinder can be held in lathe, milling machine or shaper for rapid and accurate external or internal grinding on dies, punches, cutters, centers, etc.

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PURE LAKE
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- FOR PROMPT DEPENDABLE DELIVERIES
- FOR EASY WORKABILITY
- FOR YEAR 'ROUND UNIFORMITY

A single order will bring prompt delivery of easy working, controlled quality copper in any size or shape you use from any one of Hussey's seven complete copper warehouses. Why not try the economy of just one order, one prompt shipment and one billing?

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trends and commodity markets in the light of the national defense program.

1 1 1
JANUARY 13

BOSTON—Dinner meeting of the *New England Association*, at Schrafft's. Speakers: Lawrence A. Appley, consultant on organization and management for the Socony-Vacuum Oil Co., "What is Ahead for Industrial and Business Management"; Dr. Arendtz of United Business Service, Irving Clukas of McGill Commodity Service, and Henry Stafford of Babson's Reports, "The Business Outlook for 1941"; John Martin, assistant to the Administrator of Priorities, Washington, "Priority Procedure." The meeting was preceded by an afternoon forum on lubrication problems, led by Fred S. Jones, industrial lubricating engineer of the Socony-Vacuum Oil Co.

PORTLAND—Dinner meeting of the *Oregon Association*, at the Mallory Hotel. The program was presented by a girls debating team from the University of Washington, a group which has appeared before more than 250 audiences. The topic was: "You and I—and Propaganda."

CANTON—Dinner meeting of the *Canton & Eastern Ohio Association*, at the Elks Club. Hon. James Seecombe, former United States Representative, was the speaker of the evening.

READING—Dinner meeting of the *Reading Association*, at the Iris Club. Round table discussion of "Priorities in Government Contracts," led by Frederick Moeser of Pottstown.

HOUSTON—Luncheon meeting of the *Houston Association*, at the Rice Hotel. Speaker: C. J. Crampton, assistant manager of the Houston Chamber of Commerce, "National Defense Procurement."

1 1 1
JANUARY 14

NEW YORK—Dinner meeting of the *Metropolitan Purchasers' Association Club*, at Midston House. Speaker: W. W. Stewart, Secretary-Treasurer of Southeastern Cotton, Inc., "An Important Item not Appearing on the Financial Statement." Forum discussion on "Outline of Purchasing Procedure Records," led by George A. Dietrich of New York University.

MILWAUKEE—Dinner meeting of the *Milwaukee Association*, at the Elks Club. Speakers: Capt. H. Ledyard Towle, director of advertising and creative design, Pittsburgh Plate Glass Co., "If You Can't Retool, Restyle"; and P. H. Weigand of the Milwaukee technical department, Pittsburgh Plate Glass Co., "New Developments in Paints." Prof. Lee E. Lawrence of the University of Wisconsin discussed political and eco-

*An open message to Johns-Manville Employees**

by LEWIS H. BROWN, *President, Johns-Manville Corp.*

AS THIS NEW YEAR BEGINS, I am glad to have this opportunity to discuss with you the big job facing all of us during 1941.

Because of the demands placed on every business and every citizen by our nation's need for an adequate defense, our work is clearly cut out for us. We must contribute to the utmost of our ability to the defense building program.

Already, one-third of all J-M production is demanded for defense requirements. And this demand is growing daily. Some of it has been due to the increased need for J-M products for direct government projects. Some of it is the result of sales to expanding industries which use our products and are themselves working at top speed to fill government orders.

* * *

With every increased demand Johns-Manville has stepped up production to meet it. Many departments of our seventeen mines and plants have been affected by the defense needs and are now operating seven days a week, 24 hours a day. The working day is divided into three shifts of eight hours. At many locations, four shifts of employees work 40 hours each week to assure full production of the machines 7 days a week. Thus, work on Saturdays and Sundays is distributed fairly among everybody affected.

As the defense program develops we will necessarily have to step up our production more and more. This means we will have to find all the "bottlenecks" and increase the productivity of every machine.

Of course, most of us would prefer that industry's policy could be "business as usual." But these are not normal times. Business can-

not be conducted "as usual" in an emergency. Defense comes first.

* * *

As a company, J-M is not going to let anything or anybody stand in the way of expediting the government's efforts to complete the defense program. This means co-operation by all of us, by management and by employees.

Naturally we shall all be called upon to make sacrifices. Taxes will be heavier. Raw material and manufacturing costs will probably rise. We shall all have to bear the burden.

Under these circumstances we shall have to redouble our efforts to reduce waste and increase efficiency so that we not only will be able to deliver quality goods in record time, but keep prices in check. By doing this we shall be helping to keep the costs of the defense program down. As taxpayers we shall indirectly benefit through this economy, for all of us must pay our share of the enormous defense bill.

* * *

There is no doubt in my mind that J-M job-holders can be relied upon to do their part. You have already shown the spirit of real co-operation and patriotism which is so necessary. For your co-operation I want to thank you.

I know that I can count upon your continued support and loyalty in our common effort to help keep this land of ours safe and free.

May I take this opportunity to wish for all of you health and happiness during this new year?

Lewis H. Brown

*Although not directly engaged in the manufacture of munitions or armaments, Johns-Manville manufactures many products essential to the operation of industries so engaged. This message, stating Johns-Manville's policy in support of the nation's defense program, originally appeared in the January, 1941, issue of the News Pictorial, J-M employee magazine.

EXAMPLES OF PRECISION

One in a Series of Advertisements, "HOWELL Motors in the Making" — showing how modern precision standards maintain HOWELL quality.



**HOWELL
MOTORS-**
**When You
Want Them!**

*Fast
Delivery!*

Your motor requirements—are they standard or special? Whatever your needs, the HOWELL organization is sufficiently flexible to meet them EXACTLY, and PROMPTLY. Write us today, outlining your drive problem!

Every HOWELL Motor Must Pass This Final "Exam." with Honors

Through each step of manufacture, HOWELL Motors are made as perfectly as finest materials, expert workmanship and modern precision methods can accomplish. But we don't rest there!

As a final check, ALL motors are given the EXACTING Vibration Test shown above. The motor is operated at full speed, and the Davey Vibrometer used is so sensitive that it detects deflections as minute as .0001".

As a result of this test, we know that, for all practical purposes, every HOWELL Motor is VIBRATION-FREE. And more! — since no excessive vibration is present, we know that every part fits and functions properly — that every motor is mechanically RIGHT!

Use HOWELL Motors and you have SOLVED the drive problem on your machines!

INDUSTRIAL TYPE MOTORS . . A COMPLETE LINE

For 26 years HOWELL has specialized on polyphase motors for industrial drives. We build these motors with any electrical and mechanical characteristics required, in sizes $1/2$ to 150 HP.



TYPE SC

STANDARD OPEN TYPE MOTORS, Type SC, are recommended for normal service conditions — furnished with either sleeve or ball bearings.

TOTALLY-ENCLOSED, FAN-COOLED MOTORS, Type K with ball bearings, are widely used where dusts, fumes or moisture make ordinary open motors short lived. Totally-enclosed feature protects all working parts. Fan cooling prevents overheating in the most strenuous service.



TYPE K

HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN . . . Representatives in All Principal Cities

nomic events that have occurred since the previous meeting. An afternoon commodity clinic preceded the dinner meeting.

JANUARY 15

BUFFALO—Annual Salesmen's Night dinner meeting of the *Buffalo Association*, at the Hotel Lafayette. James E. Gheen, humorist, was the principal speaker. There were brief talks by representatives of the salesmen and purchasing men.

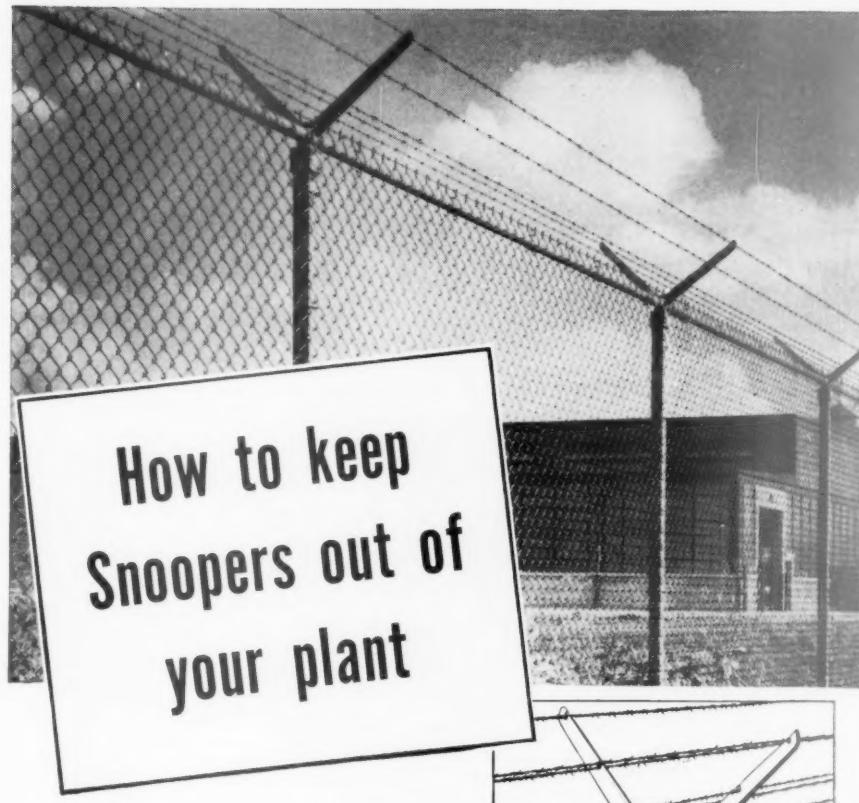
ST. PAUL—Annual meeting of the *Twin City Association*, at the St. Paul Athletic Club. The following officers for 1941 were elected: *President*, C. E. Ryburg of Theo Hamm Brewing Co., St. Paul; *Vice President*, M. E. Knutson of Minneapolis Honeywell Regulator Co., Minneapolis; *Secretary-Treasurer*, Basil L. Nelson of Northern States Power Co., St. Paul; *Director*, Eugene H. Ryan of St. Paul Brass Foundry. There was a special program of entertainment following the dinner meeting and election.

JANUARY 16

CLEVELAND—Dinner meeting of the *Cleveland Association*, at the Hotel Cleveland. George E. Price, Jr., of Akron, N.A.P.A. President, was guest of honor, and spoke on national affairs. A round table discussion of "The Economics of National Defense" was led by three leading Cleveland economists. Prof. Frank T. Carlton of the Case School of Applied Science discussed labor relations; Paul J. Eakin, statistician of Hornblower & Weeks, spoke on the financial aspects; and Russell Weisman, Associate Professor of Business and Economics, Western Reserve University, dealt with the industrial phase.

SCHENECTADY—Dinner meeting of the *Eastern New York Association*, at the Mohawk Golf Club. Speaker: Fred Jannott, "How Simmons Machine Tool Corp. Buys." The meeting was preceded by an informal reception to Harry Erlicher, recently elected Vice President in charge of purchases for the General Electric Co.

SAN FRANCISCO—"Plastics Night" dinner meeting of the *Northern California Association*, at the Elks Club. Lewis N. West of Wilson & Geo. Meyer & Co., representing the Tennessee Eastman Corp., presided at the meeting, which was featured by the showing of a sound motion picture in colors, presented through courtesy of *Modern Plastics*, an exhibit of various types of molding compounds and articles manufactured from plastics, and informative talks on thermoplastic molding compounds, injection molding, thermosetting molding compounds, and compression molding. The meeting was preceded by



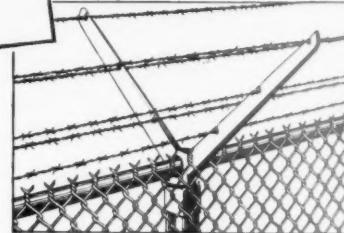
TODAY'S problem of guarding important production secrets, machinery and tools, makes plant protection vitally important. Thousands of plant owners have found Cyclone Fence the surest way to end worry about protection. Thieves and snoopers are discouraged by the high, unclimbable barrier of Cyclone—they know that even if they could get in it would surely spoil their chances of a quick getaway. And your watchmen can do a better job—checking everyone who enters or leaves the plant at the gates.

You'll save money if you use Cyclone Fence. It lasts for years, with practically no upkeep. The copper-steel wire mesh is galvanized *after* weaving, to prevent cracks which would allow rust to start. The posts, top-rails and all fittings are heavily galvanized.

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Cyclone service is fast. We can meet almost any emergency delivery requirement.



CYCLONE VICTORY FENCE has V-shaped arms holding 6 strands of barbed wire. One arm extends out from fence, the other inward. This style provides maximum in property protection.

Get all the facts. Find out how Cyclone's construction and long life can save you money. Remember that Cyclone-trained men erect your fence—men who know how to do it right. Cyclone makes many types of fence—offering you a wide choice. Write now for recommendations and estimates.



12M—This symbol represents the finest quality galvanizing money can buy. "12M" fights rust, makes your fence last longer and saves you money. Get the facts about Cyclone's "12M" galvanizing before you buy any fence.

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Branches in Principal Cities
United States Steel Export Company, New York

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Send for our free 32-page book that tells all about fence. Crammed full of facts, specifications and illustrations. Shows 14 types—for home, school, playground, and business. Whether you need a few feet of fence or 10 miles of it, you need this valuable book. Buy no fence until you see what Cyclone has to offer.

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Please mail me, without obligation, a copy of "Your Fence—How to Choose It—How to Use It."

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City..... State.....

I am interested in fencing: Industrial; Estate; Playground; Residence; School.

Approximately feet



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UNITED STATES STEEL

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STEAM LINES FROM POWER STATION
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The transmission of steam from the Edgar Station of the Boston Edison Company to the new Procter & Gamble plant at Quincy, Mass., represents an unusual demand upon engineering technique and upon the efficiency of the insulation. The pipe lines are carried overhead to the Fore River, thence underground through tunnels constructed below tide water. To minimize heat loss, the pipes are CAREY insulated throughout. About 6,000 feet of 12" and 4" pipe are included in the line.

The more difficult your insulation problem, the more essential that you entrust it to CAREY for the correct solution. The CAREY Line includes insulations that meet every service condition from sub-zero to 2500° F. A nationwide organization of experienced applicators is at your service. Write for Insulation Catalog—address Dept. 68.

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio

Dependable Products Since 1873
IN CANADA: THE PHILIP CAREY COMPANY, LTD. Office and Factory: LENNOXVILLE, P.Q.

an afternoon forum on the topic, "What Method is Best for the Purchasing Department to Use in Reporting Its Activities to Management?"

BRADFORD—Second annual Salesmen's Night dinner meeting of the *Northwestern Pennsylvania Association*, at the Pennhills Country Club, attended by more than 170 members and guests. Speakers: Association President Lee Forker of the Quaker State Oil Refining Corp., and Stuart F. Heinritz, Editor of PURCHASING, "National Defense—Our No. 1 Purchasing Job."

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JANUARY 17

TOLEDO—Dinner meeting of the *Toledo Association*, at the Hillcrest Hotel. Speaker: Delos M. Palmer, Dean of the College of Engineering, University of Toledo, and director of the University's defense activities, "Our Part in National Defense."

PORTLAND—Luncheon meeting of the *Oregon Association*, at the Mallory Hotel. Edward MacLean reported on progress made by the *Oregon Purchasing News*.

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JANUARY 20

HOUSTON—Luncheon meeting of the *Houston Association*, at the Rice Hotel. Speaker: Gus C. Street, Jr., Regional Director, Wage-Hour Division, U. S. Department of Labor, "The Wage-Hour Law."

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JANUARY 21

BLOOMFIELD, N. J.—Supper and plant inspection trip of the *Metropolitan Purchasers' Assistants Club*, at the Westinghouse Lamp Works. Special emphasis was placed on the manufacture of fluorescent lamps.

AKRON—Dinner meeting of the *Akron Association*, at the University Club. Discussion, "Present Problems in Rubber Purchasing," led by R. M. Graham of the General Tire & Rubber Co. "Department Store Buying," by representative of the M. O'Neil Co.

OAKLAND—Luncheon meeting of the *East Bay Group, Northern California Association*, at the Lake Merritt Hotel. Sound color film, "Quality Control," presented by J. A. McCormick of the Owens-Illinois Pacific Coast Co.

NEW YORK—Dinner meeting of the *New York Association*, at the Builders Exchange Club. Speaker: William J. Casey, Editor of *Business and Defense Coordinator*, "Adjusting Business Operations to Defense (with particular stress in priorities)." The meeting was preceded by an afternoon forum on "Relation of Transportation to Purchasing," led by J. L. Crosbie of Dexter Folder Co. Among the particular questions discussed were:

When writing The Philip Carey Company please mention Purchasing

Insulation Facts · Number 1.

EHRET'S 85% MAGNESIA IS
AN EFFICIENT INSULATION

Nature does not just "cover" the polar bear. She adequately protects him against the loss of body heat with a coat of efficient insulation.

In industry, where losses from heated piping and equipment give so little evidence of their presence, it is sound practice to specify only those insulations which have a proven record of high performance. For nearly half a century, Ehret's 85% Magnesia has demonstrated its unusually high thermal efficiency in practically every type of industrial service.

In addition to 85% Magnesia, the Ehret Company provides insulation for every industrial requirement, and there are Ehret Contractors or Distributors in all principal cities.



EHRET MAGNESIA MANUFACTURING CO.

VALLEY FORGE · PENNSYLVANIA

MAKERS OF INDUSTRIAL INSULATIONS FOR MORE THAN 40 YEARS

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FIBRO FORGED
TRADE MARKE
Socket Screws

Holo-Krome FIBRO FORGED Socket Screws are the results of a New and Superior method of manufacturing originated, patented and exclusively used by Holo-Krome.

Completely Cold Forged—not only is the exterior of the Screw forged but the actual Socket, the Side Walls, the Head, in fact, every particle of the Screw (threads excepted) is Completely Cold Forged—exclusively Holo-Krome.

Chrome Nickel Alloy Steel, to our specifications, scientifically heat treated to develop the utmost in strength and fatigue resistance.

The maximum physical properties are accurately determined by instrument tests in our laboratory.

The New Lustrous Black Finish adds appearance value to any product.

HOLO-KROME *Guarantees* UNFAILING PERFORMANCE

FIBRO FORGED SCREWS

are sold through Authorized HOLO-KROME Distributors



When writing The Holo-Krome Screw Corp. please mention Purchasing

How much consideration do you give to transportation costs?

What routine is followed in checking transportation bills?

Is it feasible for the purchasing department to be responsible for inbound transportation?

How familiar are you with the relative rates on materials shipped via freight, express, truck?

What effort is made in your organization to verify proper classification of the raw materials that you purchase?

ST. LOUIS—Dinner meeting of the *St. Louis Association*, at the Hotel York. Speaker: John H. Martin, Assistant to the Administrator of Priorities, Washington, D. C., "Priority."

LOUISVILLE—Dinner meeting of the *Louisville Association*, at the Kentucky Hotel. Panel discussion on "Buying Proper Quality, Quantity, and Service," led by B. Y. Heazlitt, J. C. Wagner, and Albert E. Loeffler, Jr. The problems of purchasing and getting deliveries under a national defense economy were stressed by several of the members.

FORT WORTH—Dinner meeting of the *Fort Worth Association*, at the Worth Hotel. Speaker: J. Richard Brown, Editor of the *Southwestern Purchaser*.

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JANUARY 23

SAN FRANCISCO—Luncheon meeting of the *Northern California Association*, at the Palace Hotel. Speaker: Joseph Sinel, package design consultant, "Better Packages."

LOS ANGELES—Luncheon meeting of the *Los Angeles Association*, at the Chamber of Commerce. Speaker: Harold W. Wright, Manager of the Domestic Trade Dept., Los Angeles Chamber of Commerce, "Priorities."

DETROIT—Dinner meeting of the *Detroit Association*, at Webster Hall. Speaker: Hon. John L. Carey, Mayor of Dearborn, "Fifth Column Activities."

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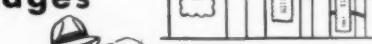
JANUARY 24

PITTSBURGH—Dinner meeting of the *Pittsburgh Association*, at the William Penn Hotel. Speaker: J. L. Colyer, President of the B. F. Goodrich Rubber Co., "New Horizons Through the Growing Use of Synthetic Materials." Special entertainment was furnished by H. L. McKeever, Assistant to the Director of Purchases, Westinghouse Air Brake Co.

PORTLAND—Luncheon meeting and plant visit of the *Oregon Association*, at the new warehouse of Van Water & Rogers, Inc.

SHIPPING TRAGEDY NO. 12

Cost was no object
line of packages



when Mr. X redesigned his
dealer drive and introduced them with a special



and a formidable advertising campaign.



But he elected to save a few dollars



by shopping for

cheaper shipping cases.



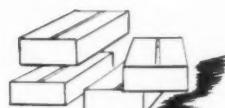
When dealers did not reorder



because their customers would not buy, he found that Concealed



Damage



had destroyed his line's shelf appeal,



and his standing with dealers and customers!

Commercially accepted standards for shipping cases frequently are not enough to prevent Concealed Damage to contents, because they do not take case fabrication into consideration. Container Corporation's new method of Certified Fabrication stabilizes

the variables in case fabrication through laboratory control of all operations. Certified Fabrication has cut down Concealed Damage for many shippers—and offers distinct advantages for you. Send for the booklet, "Inside Story," which describes it in detail.



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Please send me a copy of "Inside Story," which explains Certified Fabrication.

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Name _____
Company _____

Ad. 155

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Right he is! Paintcil—for permanently marking materials exposed to the elements—is *something!* Eliminates the cumbersome, costly paint bucket and brush method. Handy as a pencil to carry. Can be used on any hard surface, such as wood, metal, glass, etc.

Exposed indefinitely to the elements, markings remain as sharp and clear-cut as the day they were made.

Distinctive types for marking *hot* metals, too!

ASK YOUR JOBBER OR WRITE US DIRECT

If your jobber doesn't handle Paintcil, write direct for samples and full details. Simply say which type you want — for *hot* markings or *cold* markings.

PAINTCIL

Paint in Stick Form

HELMER-STALEY, INC. 323 W. Huron St., Chicago, Ill.

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JANUARY 25

DAYTON—Dinner dance of the *Dayton Association*, at the Biltmore Hotel. George Lebert of The Standard Register Co. was chairman of the committee on arrangements.

SEATTLE—Midwinter dinner dance of the *Washington Association*, at the New Washington Hotel. The committee in charge included Walter Dykema (Chairman), S. C. Evans, R. K. Maus, F. J. Palank, John Robinson, John Sullivan, and Frank Carson.

JANUARY 27

PROVIDENCE—Dinner meeting of the *Rhode Island Association*, at the Narragansett Hotel. Speaker: Herbert N. McGill, President of the McGill Commodity Service, "The Commodity Situation."

JANUARY 28

OAKLAND—Luncheon meeting of the *East Bay Group, Northern California Association*, at the Lake Merritt Hotel. Speaker: Ferdinand V. Custer, head of the Social Studies Department, Castlemont High School, "American Policy in the Far East."

BRIDGEPORT—Dinner meeting of the *Connecticut Association*, at the Algonquin Club. Speaker: F. Albert Hayes, Purchasing Agent of the American Hide & Leather Co., Boston, District Vice President of the N.A.P.A., "Trumpets in the Morning."

SYRACUSE—Dinner meeting of the *Syracuse & Central New York Association*, at the Onondaga Hotel. Speaker: Dr. Lewis Haney of the Graduate School of Business Administration, New York University, "The Business Outlook for 1941."

JANUARY 29

LOS ANGELES—Plant visit and luncheon meeting of the *Los Angeles Association*, at the Weber Showcase & Fixture Co.

ROCHESTER—Industrial Products Exhibit, sponsored by the *Rochester Association*, at Powers Hotel. C. D. Hart of Taylor Instrument Co. was chairman of the committee on arrangements. Jack Knabb addressed dinner meeting held in connection with the exhibit.

NORTH QUINCY, MASS.—Plant visit of the *New England Association*, at the Pneumatic Scale Corp.

JANUARY 30

SAN FRANCISCO—Luncheon meeting of the *Northern California Association*, at the Palace Hotel. Speaker: Herb Caen, columnist of the San Francisco Chronicle and radio commentator.

Prominent Users of Strathmore Letterhead Papers: No. 20 of a Series



do they see

PRECISION IN YOUR LETTERHEAD?

PRECISION is the watchword at Radio City Music Hall. You see it in the coordinated dancing of the famous Rockettes...the courteous efficiency of the ushers...the functional design of the theatre itself.

And for its letterhead, the Radio City Music Hall chose Strathmore Paper, because it expresses its business precisely...is truly representative of the world's largest theatre.

You want precision in *your* letterhead...want it to express exactly the spirit of your business. And Strathmore Paper can convey this character of impression for only a fractional difference in cost.

A letter written on STRATHMORE BOND, or STRATHMORE WRITING, costs less than 1% more than a letter written on the cheapest paper you might buy. And on STRATHMORE PARCHMENT, or STRATHMORE SCRIPT, as fine papers as can be made, a letter costs only 2.9% more. Such plus value, for so little cost difference, is sound business economy. Strathmore Paper Company, West Springfield, Mass.

STANDARDIZE ON STRATHMORE

When you specify STRATHMORE for a letterhead, you know you will get a quality paper...with a really fine reputation...at a moderate cost. STRATHMORE means value. Value to your business because it makes a fine letterhead. Value, too, because it keeps the budget down.

Business executives know the Strathmore reputation. And Strathmore advertisements like this prove the value of that reputation, by pointing out how big business firms do Standardize on STRATHMORE.

This series appears in:

FORTUNE

TIME

BUSINESS WEEK

NEWSWEEK

ADVERTISING & SELLING

PRINTERS' INK MONTHLY

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STRATHMORE

**MAKERS
OF FINE
PAPERS**

When writing Strathmore Paper Company please mention Purchasing

**COORDINATED PURCHASING FOR
NORTH SHORE COMMUNITIES**

Under the leadership of the Village of Winnetka, Illinois, a group of neighboring communities along Chicago's suburban North Shore have instituted an informal program of coordinated purchasing of commodities common to all. The first such project was undertaken in February, 1939, on liquid chlorine, used in the respective water filtration plants. There being complete agreement on the grade used, in conformity with the specifications of the American Water Works Association, bids were asked on a quantity totalling approximately

35,000 pounds, to be delivered as required to each town, with separate invoicing, thus retaining the advantage of individual service and obviating the necessity of a central organization and accounting. Nine bids were received. The company receiving the award had actually done business with five of the seven communities prior to the consolidation of requirements, but the larger quantity on one transaction permitted a saving of more than \$500.

This experience has been followed by the extension of the principle to other commodities. Activated carbon is bought jointly by three communities at

a substantial saving. In other cases, the smaller suburbs have bought limited quantities of standard materials from a larger town, receiving the advantage of the quantity discount earned by the latter. Under consideration are the coordinated purchase of fire hose and tar for street paving, both of which are characterized by a very rigid price structure. The plan is frankly in an embryonic stage, and the greatest advantages are still to be demonstrated. It has been established, however, that through such centralized purchasing, and larger purchasing power, the communities have been able to join forces to common advantage.

The participating communities include Evanston, Glencoe, Highland Park, Lake Forest, Kenilworth, Wilmette, and Winnetka. The informal purchasing agreements are but one of several co-operative ventures, which include contractual agreements for fire protection, incinerator operation, water service, intercommunication on police radio, and joint use of personnel for such functions as park supervision, health administration, milk inspection, and the like.

BUNTING wholesalers and Bunting warehouses everywhere in the United States carry ample stocks at all times of



- Completely machined and finished Cast Bronze Bearings in hundreds of sizes for every application in all kinds of machinery.
- Electric Motor Bearings for equipment and replacement for all makes and all sizes of electric motors.
- Tubular and Solid Bearing Bronze Bars, finished I.D., O.D. and Ends, in hundreds of sizes.

The Bunting Catalog puts you instantly in touch with millions of finished bearings ready to use. Write for your copy. The Bunting Brass & Bronze Company, Toledo, Ohio. Warehouses in All Principal Cities.



When writing The Bunting Brass & Bronze Company please mention Purchasing

**COLLECTIVE PURCHASING
AT MILWAUKEE**

At a meeting in Milwaukee, October 17th, preliminary plans were made for voluntary centralization of purchases among the governmental, educational and institutional agencies of that vicinity. Following a general discussion of the project and its advantages, it was moved that a committee be appointed by Mayor Carl F. Zeidler of Milwaukee, to form an operating plan for a form of coordinated purchasing, the committee to consist of representatives from the various types of units: city, county, village, town, library and school boards, with Mayor Zeidler as chairman. The following representatives were appointed:

G. E. Watson, Superintendent of Schools, Waukesha, Wis.

J. W. Nicholson, City Purchasing Agent, Milwaukee.

Mayor Delbert Miller, City of West Allis, Wis.

William Coffey, Director of Milwaukee County Institutions.

Alfred W. Einfeldt, Chairman of Town Board, Town of Milwaukee.

William Cavanaugh, Commissioner, Milwaukee County Highway Commission.

Mrs. Pauline Bernhardt, Member of School Board, City of West Allis.

William Boyd, Purchasing Agent, Board of School Directors, Milwaukee.

Ralph Uihlein, Village of River Hills, Wis.

Leo Landry, Member of School Board, Shorewood, Wis.

In addition to the communities and boards represented on this committee, the following communities were invited to participate: South Milwaukee, West Milwaukee, Fox Point, Whitefish Bay, Cudahy, Oak Creek, Lake, Greendale, Franklin, and Granville.

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by HYGRADE



the pioneers

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Miralume F-100: 100-watt unit; 2 40 watt lamps. No nuts or bolts mar porcelain enameled reflector surface.

**No other fluorescent lighting fixtures in the world
combine all these advantages of Hygrade MIRALUMES!**

- ✓ **Finer light**—produced by Hygrade's patented lamp coating.
- ✓ **Sure, trouble-free starting!**—assured by Hygrade's patented, easily accessible Mirastat starters.
- ✓ **Lower maintenance**—thanks to Hygrade's easily demountable reflectors and patented lamp holders.
- ✓ **Guaranteed satisfaction!** Miralumes carry a complete guarantee covering lamps, fixtures, starters, *everything*!
- ✓ **Easier installation!** Miralumes are supplied wired and ready to install (on FHA financing, if desired)—with high power factor circuit — complete with superior Hygrade Lamps.
- ✓ **Superior performance!** Miralumes are quality manufactured—better designed and engineered throughout—approved by Underwriters Laboratory.
- ✓ **And vitally important:** Extraordinary lighting efficiencies are obtained by tuning the ultra-violet energy to 2537 Angstrom Units effective in causing the porous film (Hygrade Patent #2,096,693) to generate light as shown in Hygrade controlled Patent #2,126,787. Hygrade products are exclusively protected by nearly a hundred other patents, including #2,201,817 and #1,982,821.

Van Raalte Co., Inc. (Hosiery Mill), Boonton, N. J. 8 footcandles jump to 20 after Miralume installation. Higher levels of beautiful, cool, shadow-free light cut rejects. Workers see better, work better, feel better! Write today for free Miralume catalogue. Dep't P 2, Hygrade Sylvania Corp., Ipswich, Mass.

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Completely Guaranteed Fluorescent Lighting Fixtures

Copr. 1941 Hygrade Sylvania Corp., Est. 1901. Makers of Hygrade Fluorescent and Incandescent Lamps and world-famous Sylvania Radio Tubes.

When writing Hygrade Sylvania Corp., please mention Purchasing

INVENTORIES HEADED UP

A report by the National Industrial Conference Board, released last month, analyzes the course of inventories during the year of abnormal business conditions caused by the war in Europe.

Stocks of goods held in inventory by manufacturers began to rise in September, 1939, increasing 19% in five months. When it became apparent that few actual shortages were developing, and that prices were not likely to advance sharply, the accumulation of additional stocks ceased, and manufacturers' inventories in the first half of 1940 showed little change, holding close to the January level. Since July the index has again

moved upward, chiefly as a result of the defense program, and a new period of stock accumulation is apparently again under way. No great concern is expressed on this score, however, as in general the inventory position is not overextended, and much depends on the outcome of factors which are now very uncertain. For example, the probable duration of the war in Europe, the speed with which our own defense program will get under way, and the effect of that program upon the normal volume of civilian consumption, are matters of only conjecture, at best. The broadening scope of manufacturing operations must also be considered, and this shows the

ratio of inventories to output at a point somewhat lower than the average for the preceding eleven-year period.

Inventories heavier than the composite average are found in railway equipment, building equipment, machinery, steel, chemical, paper, clothing, and textile industries. This reflects the influence of war demands, and, in the case of paper, a protective policy made necessary by the curtailment of pulp sources and a generally upward price trend.

The raw materials index has been consistently rising for some months past, but is still low in comparison with previous years. The same is true of semi-processed goods. Stocks of finished goods have been moving irregularly since the beginning of the year, but are averaging higher than during the past two years.

Analyzed according to individual commodities, high stocks are found in gasoline, hosiery, and woolen cloth. Relatively low stocks are held of rayon yarn, raw wool, hides and leather, lead, zinc, copper, and crude rubber, though since the middle of 1940 such essential materials as copper and rubber are being accumulated in satisfactory volume, with the assistance of the governmental program of building up national supplies of these commodities.

Stocks of agricultural products are in plentiful supply, with the normal outlet to European markets closed, and troublesome surpluses may pile up, particularly in cotton and tobacco.

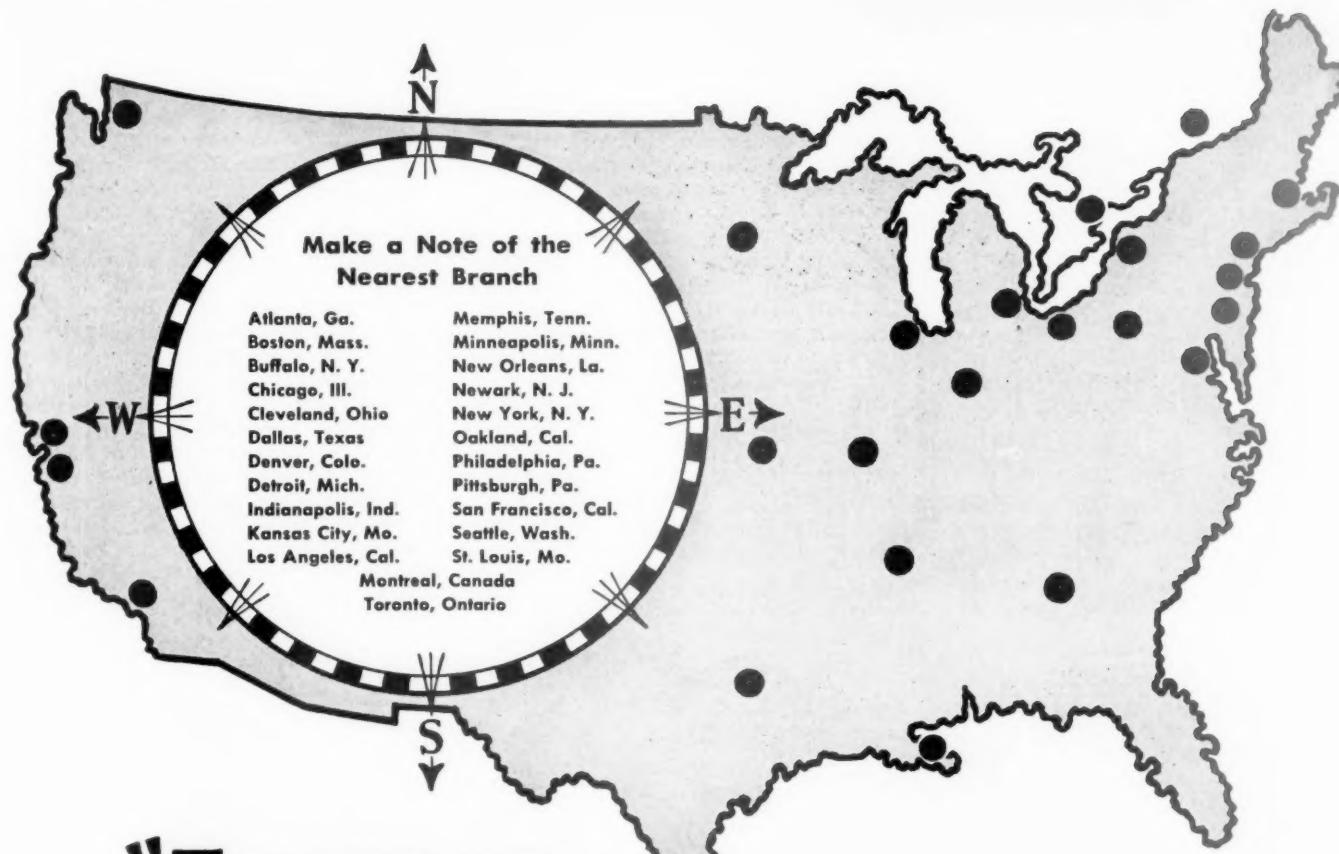
Wholesalers' stocks are fairly high. They reached a peak in March, 1940, when inventories were reported 8½% higher than a year previously. That percentage has since been reduced somewhat. The situation is not regarded as dangerous, in view of generally low inventories in the retailing field, where a tendency has been noted for some time to place the responsibility for carrying stocks back on the wholesale dealer or the manufacturer. Retail sales volume has been expanding notably during the year, which is a further indication that wholesale inventories are not at all in a dangerously high range, and that retail inventories will probably be built up rather substantially before the closing months of the year.

The report states, in summary, that there is not yet any indication that any serious inventory situation is about to develop in any major segment of industry. Certain stocks will undoubtedly be further built up as the direct and indirect effects of the defense program begin to be felt. As the business cycle advances, however, increased caution should be applied to inventory control.

When writing Continental Screw Company please mention Purchasing

J. V. Reardon has resigned as Purchasing Agent for the Barde Steel Co., Seattle, to join the sales staff of the Seattle Steel Co.

William S. Moore of Ridgewood, N. J., has been reappointed Purchasing Agent for Bergen County, for a three year term.



"FACTORY SERVICE" *All over the Map*

Cuts Down "Time Out" for Tool Repairs



Factory Trained Mechanics give prompt, efficient service to Black & Decker Tool owners from coast-to-coast. You can have factory service, no matter where you are located.

With industry in high-gear, fast servicing of electric tools is an absolute necessity. Black & Decker Tools don't have to be sent "back to the factory" for overhaul—with consequent delays and tie-ups. There are 25 Black & Decker Factory Branches in strategic United States and Canadian cities—set-up to deliver "factory service." Each Branch is manned by factory-trained mechanics, equipped with complete servicing and repair facilities, including genuine B & D replacement parts. The *only* such facilities in the portable electric tool industry.

By making Black & Decker Quality Tools your choice, you first minimize repairs. Secondly, if you should need service, you eliminate delays. Consider these facts—then ask your distributor to demonstrate the portable electric tools you need—or write: The Black & Decker Mfg. Co., 764 Pennsylvania Ave., Towson, Md.

"ELECTRIC TOOL HEADQUARTERS"

Black & Decker

SOLD BY LEADING DISTRIBUTORS EVERYWHERE

When writing The Black & Decker Mfg. Co. please mention Purchasing

TIN SUPPLY IS ASSURED

The Industrial Materials Division of the National Defense Advisory Commission, working in conjunction with the Metals Reserve Co., announces that reserve stocks of tin are rapidly being accumulated in this country, and that supplies already on hand or in transit to the United States are sufficient to meet requirements for from nine to twelve months. The purchasing has been done by the Navy Department, the Procurement Division of the Treasury Department, and the Metals Reserve Co., which is organized under the Reconstruction Finance Corp. Deliveries in August set a new peak of 12,400 long tons, about

twice the amount of a normal month's consumption, and 22,364 long tons were afloat to the United States at the end of the month. Purchasing was accelerated in September.

In explaining the purchase program, Edward R. Stettinius, Jr., heading the Materials Division, pointed out that the normal U. S. tin consumption of 70,000 to 80,000 tons a year would be substantially increased when full production is reached on tin plate, solder, bearings, and other tin products required for defense equipment. Virtually all of the tin now consumed in this country comes from British Malaya and the Dutch East Indies. If shipments from these sources

were interrupted due to unsettled world conditions, our own industrial operations might be seriously retarded. Consequently the accumulation of reserve stocks is essential.

To expedite the acquisition of necessary supplies, the Defense Commission has arranged with principal producers to increase their mining operations. Conferences have also been held with private groups interested in establishing a tin smelter in this country for the processing of ore from Bolivia. Except for experimental plants, there are no tin smelting facilities at present either in Bolivia or in this country, he stated.

The Commission is further surveying the possible use of substitute materials for some present applications of tin, and is exploring the possibility of increasing scrap recovery. Ordinary tin cans are not available for scrap purposes, but there is a normal reclamation of some 7,000 to 8,000 tons of "clean scrap" annually, and this might be broadened to some extent.

TRUE or FALSE?

ANY PAINT CAN BE USED ON CONCRETE, STUCCO or MASONRY



♦ Just any paint can't be used on concrete, stucco and masonry. Due to alkalies and moisture in the wall, ordinary paints quickly chip or peel off. Medusa Portland Cement Paint with its Portland cement base keys itself to these surfaces and sticks permanently. It is unaffected by moisture, alkalies or lime. This paint forms a beautiful, hard, permanent, cement-like finish. It is inexpensive and easy to apply to damp or dry,

exterior or interior walls. It is highly suitable for exteriors of brick, concrete and stucco buildings; for warehouses, basements, storage bins and smoke stacks. It is mixed with water instead of costly thinners and can be sprayed or brushed on. There is a selection of eight colors, black and white. Send for a copy of the free book, "How To Paint Concrete, Stucco, Masonry and Other Surfaces."

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PORTLAND CEMENT
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Medusa Products also made in Canada by Medusa Products Co. of Canada, Ltd.



MEDUSA PRODUCTS COMPANY
Div. of Medusa Portland Cement Co.,
1011 Midland Bldg., Dept. A, Cleveland, Ohio

Gentlemen: Please send me a copy of the book "How to Paint Concrete . . . Stucco . . . Masonry and Other Surfaces."

Name

Address

City State

CHANGES AT WESTERN ELECTRIC

Kingsley C. Gernon, Works Purchasing Agent at the Point Breeze (Md) plant of the Western Electric Co., has been promoted to the position of Assistant Purchasing Agent at the company's New York headquarters. Hardy G. Ross, buyer at the Point Breeze plant, has been named Works Purchasing Agent, and Emil A. Hoppensteadt, chief of the material ordering section in the wire products shops, becomes buyer.

Lloyd D. Bates, formerly Purchasing Agent for the Hudson Navigation Co. at Albany, N. Y., has been named promotion manager for the Ten Eyck Hotel of that city.

Jack Harding has been appointed assistant to the Purchasing Agent, University of Washington, succeeding Merrill Conner, who has accepted a position with the Bonneville Power Authority.

C. E. Arney of Pocatello, Idaho, has been named acting State Purchasing Agent.

Joseph F. Drennan, City Purchasing Agent at Springfield, Mass., addressed the members of the City Council last month, reporting progress in the organization of his department.

E. J. McCall has been appointed Purchasing Agent for the City of Bremerton, Washington, in addition to his duties as City Clerk.

T. A. Christy has been appointed Purchasing Agent for Monroe County, Ohio.

Leon E. Gillingham, Purchasing Agent of the Syracuse (N. Y.) Rendering Co., has been elected to the board of directors of the Traffic Club of Syracuse for 1941.

24 miles of K&M insulation saves fuel in Buffalo's Lake View Housing Project



Airplane view of Buffalo's Lake View Housing Project, in which approximately 24 miles of K&M heat insulations conserve fuel. The materials were supplied and installed by E. J. Eddy Co., Inc.

THE Lake View Housing Project of the Buffalo Municipal Housing Authority, Buffalo, N. Y., is a tremendous operation, as shown by the photograph above. With approximately 24 miles of steam and water lines, the efficiency of the heat insulation selected was bound to have an important bearing on fuel cost.

For that reason, it is significant that Keasbey & Mattison "Featherweight" 85% Magnesia, and Duplex Sectional Pipe Covering were selected.

K&M products were used, not only on steam and hot water lines, but to insulate steam boilers, breechings, and hot water storage tanks. The choice of these materials for a housing project parallels their extensive use by the various branches of industry, in which K&M insulations are saving heat, fuel and dollars with unsurpassed efficiency.

Keasbey & Mattison, pioneers in the development of asbestos and magnesia products, produce a line of insulations that are specialized for every need. One of the



most efficient and widely used of all forms of heat insulation is K&M "Featherweight" 85% Magnesia, for temperatures up to 600°F.

K&M engineers, working with K&M Distributors strategically located throughout the country, can point the way to real savings in your plant, too. Write Dept. 11 for full details.



K&M "Featherweight" 85% Magnesia

"The Time-Proven Insulation"

KEASBEY & MATTISON
COMPANY, AMBLER, PENNSYLVANIA

When writing Keasbey & Mattison Company please mention Purchasing

**NEW BOOK ISSUED ON
BLUE PRINT READING**

The Lincoln Electric Co., Cleveland, Ohio, has published a new book, "Simple Blue Print Reading with Special Reference to Welding." It affords a basis for study of the subject which, with practice in the actual reading of drawings, will guide the student to proficiency in the important phase of welding practice, furnishing information that would require many months to pick up in the ordinary course of everyday work. While not intended as an exhaustive treatise on blue print reading, it affords a sound basis in the fundamentals. The text is concise, practical, and written for easy

understanding. One hundred sixty-four clear drawings illustrate the principles that are discussed.

Beginning with an introduction which points out the importance of being able to read blue prints, the book takes up the following important subjects:

Simple welded object presented as a study; picture drawings of the subject; perspective drawing; isometric drawing; limitations of these and other types of picture drawings; showcase views (orthographic projection); analysis of point and line projection; line "alphabet"; hidden and visible outline; center lines, dimension lines, extension lines, break lines, cutting plane lines; dimensions,

how presented, how interpreted; scale, transformation in size by a known ratio; presenting and interpreting slanting surfaces accurately; sections; broken views, omitted parts of indicating weld position; method of indicating type of weld, size and shape of weld, length of weld and other necessary information; analysis of complete weld symbol and its use.

A comprehensive explanation gives the student a clear understanding of the various symbols used in the drawing of different types of welded joints, including butt, corner, fillet, lap, etc. The numerous illustrations include practical examples of drawings of typical machine parts, pipe connections, general construction, tanks, etc. A list of questions and answers allows the student to test his knowledge.

The book consists of 138 pages, 6 x 9 inches, with semi-flexible cover. It can be obtained directly from the Lincoln Electric Co., at the price of 50 cents per copy, postpaid within the United States, 75 cents per copy elsewhere.

BRUSH IT • DIP IT • SPRAY IT

Steelbrite

THE BETTER RUST PREVENTIVE

A Better Way

TO PROTECT YOUR PRODUCTS FROM

Rust

NO LONGER is it necessary for you to cover your finished products with messy grease or oil to protect them from rust during storage or shipment. Steelbrite does the job thoroughly and inexpensively. It is non-inflammable, may be brushed, sprayed or dipped, and sets up with a firm, clean, transparent surface. This coating is easily removed if desired but offers positive protection from rust.

Steelbrite is a proven product. During the past few years it has been completely tested under all conceivable conditions, including export shipping with its salt water hazard. Steelbrite may be used on shelf goods and on other products packed for eye-appeal. It will not stain the wrapper or carton.

The price is very much in line... only fifty-five cents in drums. And Steelbrite goes a long way. Why not write today for a trial gallon? Only ONE company among those adopting Steelbrite has ever discontinued its use. There must be something back of a record like that. May we have your order for a trial gallon?

A PRODUCT OF THE SKYBRYTE CO. CLEVELAND, OHIO

When writing The Skybryte Co. please mention Purchasing

1 1 1

COORDINATE TREASURY BUYING

Establishment of a new liaison office between the forty-three field Procurement Officers and the Procurement Division in Washington has been announced by the Treasury Department. This new office is designated as the Field Inspection Division.

The primary function of the Field Inspection Division is the coordination, simplification and standardization of the activities of the field Procurement Officers, who in the past have been functioning independently under the general supervision of the Director of Procurement. These officers, located advantageously throughout the United States, make purchases for the Emergency Relief activities and the National Youth Administration. Their purchases, which range from road building and construction materials to clothing and foodstuffs, amounted to \$233,700,000 during 1939.

The Field Inspection Division, under the new plan, will conduct regular and periodic surveys of the various offices in order to coordinate purchasing activities, simplify procedure, and standardize specifications and forms. The surveys will be performed by six or seven men highly trained in all phases of procurement work.

Mr. A. J. Walsh, chief of the Emergency Branch, formerly in charge of the regional procurement office at Boston, Massachusetts, will have supervision of the Field Inspection Division.

1 1 1

L. O. Myers has been appointed chief clerk and Assistant Purchasing Agent for Hamilton County, Tenn. Under a reorganization plan following the death of Fred Frawley, County Purchasing Agent, the buying is being supervised by Wells Rather, Chattanooga City Purchasing Agent, with Mr. Myers as his assistant.

"This week we placed several orders with you, all of which arrived at our plant the following morning, almost before our men had started to work. We wish to thank those in your organization responsible for this fine attention to the business we place with you."

FROM LETTER RECEIVED BY
SCULLY CHICAGO WAREHOUSE



Imagine being thanked for attending to business!

CUSTOMERS are frequently surprised at our speed in delivering orders. Sometimes, when there is an emergency, we seem to do the impossible. But each Scully Warehouse operates on the basis that all customers always want immediate shipment and friendly consideration. Fast service is the rule at Scully — not the exception. Right now, whether or not you are working on defense orders, when you

need steel you need it *quick*. And we have it—on hand in eight warehouses located in the big manufacturing centers where we can get it to you in a hurry. So whenever you need steel, steel products, copper or brass—call Scully. We've made the Scully name famous by serving all customers, large or small, with equal speed and courtesy.

Send for the Scully Stock List and Reference Book . . . it's free

SCULLY STEEL PRODUCTS COMPANY

Distributors of Steel, Steel Products, Copper and Brass

Warehouses at CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON
ST. PAUL-MINNEAPOLIS · CLEVELAND · PITTSBURGH · BALTIMORE

UNITED STATES STEEL

When writing Scully Steel Products Company please mention Purchasing



The Mark of Service

ALLOYS
ANGLES, HOT ROLLED and COLD ROLLED
ARCHES (CORRUGATED)
BABBITT
BANDS and HOOPS
BARS, HOT ROLLED
ALLOYS (HR and CF)
COLD FINISHED
ELECTRIC HIGH CARBON STEEL
REINFORCING
BEAMS and C. B. SECTIONS
BEEF RAIL
BOLTS, NUTS, WASHERS, ALL KINDS
BORING and TURNING BARS and GRINDERS
BRACES, BOILER
CHAIN, ALL KINDS
CHANNELS
CHISELS
CHUCKS, STAYBOLT
CLAMPS, BOILERMAKERS
CLIPS, PATTERSON
CLEANERS, FLUE
CONDUCTOR PIPE
COPPER and BRASS
COUPLINGS, HOSE
CRAYONS, SOAPSTONE
CUTTERS
DARDELET RIVET and MACHINE BOLTS
DRILL RODS
EAVE TROUGH and FITTINGS
EXPANDERS, FLUE
FERRULES, COPPER
FLANGES, BOILER and TANK
FLOOR PLATES
GALVANIZED SHEETS, BARS, BANDS
HANDLES, HAMMER
HEADS, TANK and FLANGE
HOISTS, HAND and POWER
IRON, STAYBOLT
LUGS, BOILER, TANK and SILO
MACHINERY, HAND and POWER
MANHEAD PLATES and FITTINGS
NAILS
PACKING
PAINT STICKS
PLATE STEEL, STANDARD QUALITIES
ABRASION RESISTING
COR-TEN and MAN-TEN
PLUGS, FLUE
RAILS and FITTINGS
REAMERS
SHAFTING
SHEETS
ABRASION RESISTING
ELECTRICAL
COR-TEN and MAN-TEN
HOT ROLLED and UNIFORM BLUE
WELLSVILLE POLISHED
COLD ROLLED
STAINLESS STEEL
GALVANIZED and GALVANNEALED
LONG TERM
CORRUGATED
U-S-S COPPER STEEL
SPRING STEEL BARS and SHEETS
STAINLESS STEEL
STRIP STEEL, CR and HR
TEES
TIRE, ROUND EDGE
TOOLS, HAND and POWER
for BOILER and IRON WORK
TROLLEYS
TUBES, BOILER
TURNBUCKLES
VALVES, BLOW-OFF
WELDING ROD and WELDERS
ZEEZ

The Mark of Quality



When writing Scully Steel Products Company please mention Purchasing

EASTERN MANUFACTURERS GET EARLY DEFENSE CONTRACTS

An analysis of defense contracts awarded in the first stage of the procurement program, has been prepared by the Division of Industrial Economics of the Industrial Conference Board. It shows that the contracts have been heavily concentrated among manufacturers on the Eastern seaboard. 30.8% of the awards (by dollar value) were made in the Middle Atlantic area; 21.7% in New England; 18.4% in the South Atlantic states; 12.8% in the East-North-Central region; and 12.4% on the Pacific Coast. The four remaining sections West-South-Central, West-North-

Central, East-South-Central, and Mountain, have received relatively negligible amounts.

It is pointed out that this is due to the predominance of naval construction as a factor in the early phase of the defense program. Shipbuilding represents 51% of the value of contracts under this part of the program, followed by construction (21.4%), supplies and ordnance (20.1%), and aircraft (7.5%). The four states which ranked highest in the value of awards—Massachusetts, New York, Virginia, and New Jersey—all have important shipbuilding facilities, and awards in this field made up the bulk of the totals except in the case

of New York, where this represented 60% of the value of awards.

The analysis stresses the fact that the relative position of the various regions will shift as other phases of the procurement program get under way. In the classification of supplies and ordnance contracts, for example, the distribution follows rather closely the 1937 census of the regional value of manufactured products, in which the East-North-Central states rank first in production importance. This category will gradually increase in relative importance as the defense program progresses, though naval construction will continue to predominate with the September awards for 201 additional vessels and the ultimate goal of a two-ocean navy.

Airplane contracts have chiefly (81.5%) gone to the Pacific Coast region.

The East-North-Central area leads in the value of construction orders (27%), but this figure is subject to revision on two counts—the construction figures themselves, and also the allocation, since government award lists for construction are shown according to the residence of the contractor and not according to the location of the work to be done.

VALUE OF SHIPMENTS AT HIGH RECORD

The value of manufacturers' shipments in December established a new high record, according to the National Industrial Conference Board. This situation reflects the near-capacity operations now prevailing in many lines of industry. The December index of such shipments rose to 158% of the 1935-1939 average, according to the N.I.C.B. data. This was 8 points above the previous month, and 7 points above July, 1929, which was the highest month of that year.

Actual dollar value of new orders received by manufacturers in December was slightly lower than in November, but this decline was of less than the usual seasonal proportions, so that the corrected index figure, allowing for seasonal influences, shows an advance of 1 point.

The increase was fairly general in the durable goods industries, with advances recorded in such important industries as automobile equipment, building equipment, electrical equipment, iron and steel, machinery and metal products. The chief exception to the upward trend among the heavy industries occurred in railway equipment. Orders for housefurnishings were also lower.

In the non-durable goods industries, advances in the orders for shoes, clothing and chemicals counterbalanced a lower demand for paper and textiles.

Inventories advanced 1% during December, continuing the slow but persistent rise that has characterized every month since the beginning of 1940.

The greatest single factor behind the increasing volume is the National Defense program. New business placed by the Army and Navy in December amounted to 1,411 million dollars, as compared with the 1,237 million dollars' worth of orders placed in November.

Uncanny Accuracy

Glamour in cotton! The textile industry finds many uses for Dumore grinders.

Two Dumore No. 9's at work on a production job.

A Dumore "Chief" resurfacing a rubber printing ink roller at the George Lovelock Co., East Orange, N. J.

Dumore has developed grinders of uncanny accuracy for the widest imaginable variety of applications. Your Dumore distributor will show you how to reduce labor, spoilage, and overhead. Feel free to call on him . . . there's no obligation.

THE DUMORE COMPANY
Dept. 351-B RACINE, WIS.

Precision personified! Dumore help produce Pratt & Whitney motors.

While air hostesses popularize air travel . . . Dumore grinders bring mechanical perfection that greatly increases safety (TWA Photo)

Heavy grinding, internally or externally, to .0001" accuracy, is "right down the alley" for a Dumore No. 12.

The capacitor-start induction-run motor of the Dumore "Chief" delivers a maximum power output for its size and works at constant speed. The "Chief" is available with one external and five internal quills.

Dumore PRECISION Grinders

When writing The Dumore Company please mention Purchasing

LYON Can Help You "DO THE IMPOSSIBLE"

STOCK ROOMS



Lyon tool storage equipment solves the most complex tool storage problems. Protects tools. Saves floor space. Reduces tool handling delays. Maximum availability with a minimum tool inventory.

TOOL ROOMS



Lyon adjustable storage shelving insures fast, economical handling of stock and parts. Reduces fire hazards and conserves floor space.

EMPLOYEE CLOTHES STORAGE



Lyon Shoprobe: (Patent No. 2,202,427). Minimum initial cost per person accommodated. Readily moved. Saves floor space—20 persons in each 12-1/2 sq. ft.



2-Person Lockers: Individual compartments for two people in area ordinarily occupied by single-occupancy lockers.



7-Person Lockers: Accommodates seven individuals in floor space of 36" x 20". Individual keys for small compartments; all operate large coat compartment.

PRODUCTION AND ASSEMBLY LINES



Steel Benches: Cost less to buy than to build.



Assembler's Bench Bin: (Patent Applied For). A dozen parts in easy reach. Occupies only 1 square foot of bench space.



Shop Boxes: Types to meet any parts handling need.



Tool Stands: Bring tools to the job. Saves steps.



Bench Legs: Extra heavy for durability. Riveted and welded for rigidity. Economical.

Here's How Manufacturers Everywhere are Increasing Productive Floor Space and Stepping Up Production WITHOUT WAITING FOR NEW BUILDINGS, MACHINES OR TOOLS

In these days when industrial leaders are asking for the "impossible" . . . and expecting plant executives to deliver it . . . Lyon Equipment can help solve many of the problems involved. It contributes to faster production and releases floor space by providing compact, convenient storage . . . and fast, smooth handling . . . of materials and tools. And—most important—you can have these production-accelerating, space-saving, cost-reducing aids NOW. Ask your mill supply distributor for details, or write Lyon for catalogs.

LYON METAL PRODUCTS, INCORPORATED

General Offices: 3302 Madison Avenue, Aurora, Illinois
Branches and Distributors in All Principal Cities

FLASH!

When you find a way to swing production into high gear by using Lyon Equipment, you can capitalize the advantage AT ONCE. Lyon shop and storage equipment is carried in stock for immediate shipment. Most orders are in transit within hours of their receipt at our plants and warehouses.

Catalogs illustrated below describe the complete Lyon line. Both your plant superintendent and purchasing agent should have these catalogs. Write today.



LYON Service
STORAGE EQUIPMENT

**GENERAL LICENSES ON
EXPORTS TO CANADA**

Several thousand items and materials have been brought under the licensing requirement of the Sheppard-May Act, which became effective on July 2, 1940, and provided that:

"Whenever the President determines that it is necessary in the interest of national defense to prohibit or curtail the exportation of any military equipment or munitions, or component parts thereof, or machinery, tools, or material or supplies necessary for the manufacture, servicing, or operation thereof, he may by proclamation prohibit or curtail such exportation, except under such

rules and regulations as he shall prescribe. Any such proclamation shall describe the articles or materials included in the prohibition or curtailment contained therein. In case of the violation of any provision of any proclamation, or of any rule or regulation, issued hereunder, such violator or violators, upon conviction, shall be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or by both such fine and imprisonment. The authority granted in this section shall terminate June 30, 1942, unless the Congress shall otherwise provide."

Most shippers have adopted the policy that when any doubt exists as to the necessity of obtaining a license, it is

best to make sure by applying to the State Department at Washington for such an export license. Forms of application are available at Customs Houses. The average time required for the issuance of a license is one week from filing of the application. If no license is required, the applicant is so advised.

Now in order to facilitate the release of shipments from the United States to Canada, and liberalizing the export control policy, the Secretary of State has sent to all collectors of customs a list of general licenses for the export to Canada of materials and articles for which more rigorous controls are not required in the defense program. For such articles and materials, a specific license for export to Canada will not be required.

The general licenses made public in January cover all the articles and materials for which export licenses are required except arms, ammunition and implements of war as listed in the President's proclamation of May 1, 1937; tin-plate scrap; graphite; plans, specifications, and other documents containing descriptive or technical information within the purview of the President's proclamations of September 12, 1940, and December 20, 1940.

The products which may be exported to Canada under these general licenses are as follows:

Aluminum, antimony, asbestos, chromium, cotton linters, flax, hides, industrial diamonds, manganese, magnesium, manila fiber, mercury, mica, molybdenum, optical glass, platinum group metals, quartz crystals, quinine, rubber, silk, toluol, tungsten, vanadium, wool, ammonia, chlorine, dimethylaniline, diphenylamine, nitric acid, nitrates, nitrocellulose, soda lime, sodium acetate, strontium, sulphuric acid, bromine, ethylene dibromide, methylamine, cobalt, aircraft parts, armor plate, shatterproof glass, plastics—optically clear, fire control instruments, petroleum—crude oil, gasoline, tetraethyl lead, lubricating oil, naphtha, iron and steel scrap, iron ore, pig iron, ferromanganese, spiegeleisen, ferrosilicon, ferrochrome, ferrotungsten, ferovanadium, ferrocolumbium, ferrocobaltium, ferrophosphorus, ferromolybdenum, ingots, billets, blooms, slabs, sheet bars, wire rods, structural shapes, steel piling, plates, skelps, rails, splice cars and tie plates, bars, hoops and baling bands, pipe and tubes, drawn wire, nails and staples, barbed wire, woven fence wire, bale ties, fence posts, black plate, tin plate, strip, wheels, axles, track spikes, castings, forgings, equipment for gasoline production, equipment for lubricating oil production, equipment for tetraethyl lead production.

A general license has also been announced for the export (to Canada) of the following specifically enumerated machine tools and allied products:

Pipe threading machines; metal cutting band saws; power driven hack saws; keyseating machines; disc grinding machines; car wheel and locomotive wheel presses; burring machines—gear; chamfering machines—gear; burnishing machines—gear; planers—

*Out
February 10!
"HOW INDUSTRY BUYS"
Ten Field Research Reports
On Industrial Buying Procedure
Complete in One Volume*

The cream of ideas developed in the Purchasing Departments of ten nationally known industries; the net result of years of years of testing.

Clearly and simply written. Every report boils down to a few pages material gathered in days of painstaking research.

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A simple index takes the reader direct to the idea wanted, without needless thumbing of pages.

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New York, N. Y.

Send me copies of **HOW INDUSTRY BUYS** at \$1.00.

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Timken Reports Defense Preparation Progress To Date

The Timken Roller Bearing Company submits the following report of progress made to date in its efforts to assure an adequate and uninterrupted supply of necessary material for military and supporting purposes.

Order placed for new 60-ton electric steel furnace to meet increasing demands for aircraft and other specialized steels. Furnace will go into operation in February, increasing electric steel production from 21,000 to 27,000 net tons per month. Expenditure involved, \$551,000.

New buildings to be erected at Canton, Gambrinus, Columbus, Wooster and Mount Vernon, Ohio, totalling 184,625 square feet. Expenditure involved, \$572,000.

Orders placed for new heavy-duty machine tools to increase output of TIMKEN Bearings for military equipment. Expenditure involved, \$961,825.

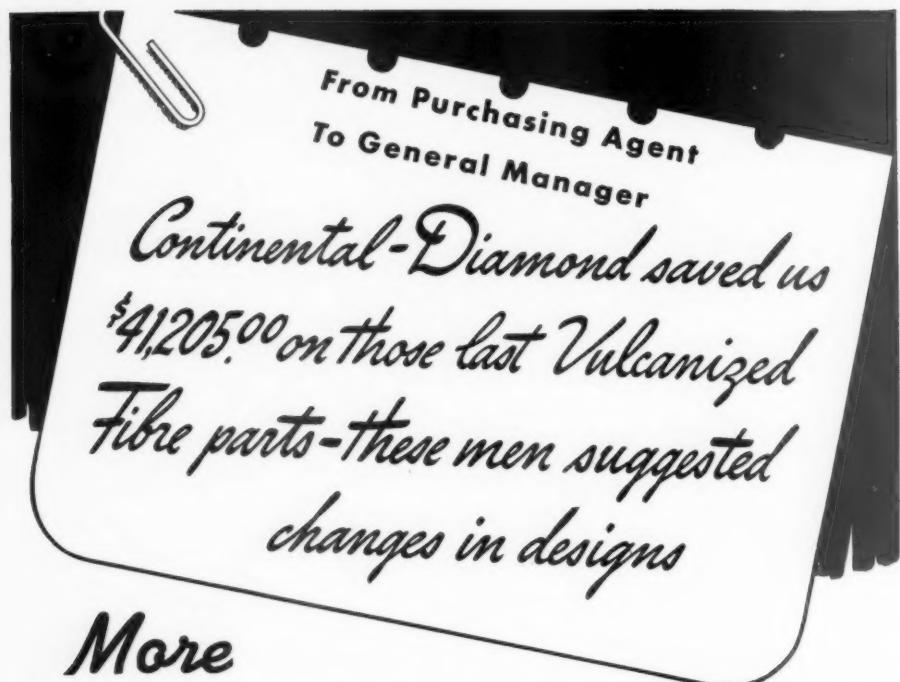
Orders placed for additional maintenance equipment to help keep manufacturing equipment operating at peak capacity. Expenditure involved, \$132,175.

Installing of a new heavy fuel oil system to assure continued operation of equipment in case of possible failure of the natural gas supply. System will include storage for 1,250,000 gallons of fuel oil, emergency distribution equipment and complete fire protection facilities. Expenditure involved, \$250,000.

Erection of a 200,000 gallon water tank to be used exclusively as an emergency water supply in case of fire which might threaten defense material production. Expenditure involved, \$30,000.

Additional reports on the progress of our defense preparations will be issued from time to time as further details become available.

THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO



More

THAN JUST SELLING GOODS!

The manufacturer whose P. A. wrote the above memo was producing a defense item . . . purchasing, handling, and working many new materials were involved. Specifications and procedures were set up based upon past experiences with then known materials—on this basis the quantities of Vulcanized Fibre parts would have cost \$45,120.00.

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cost was reduced to \$3,915.00 . . . and the effectiveness of the parts greatly enhanced.

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"The following, as defined in executive order of January 10, 1941, effective February 3, 1941:

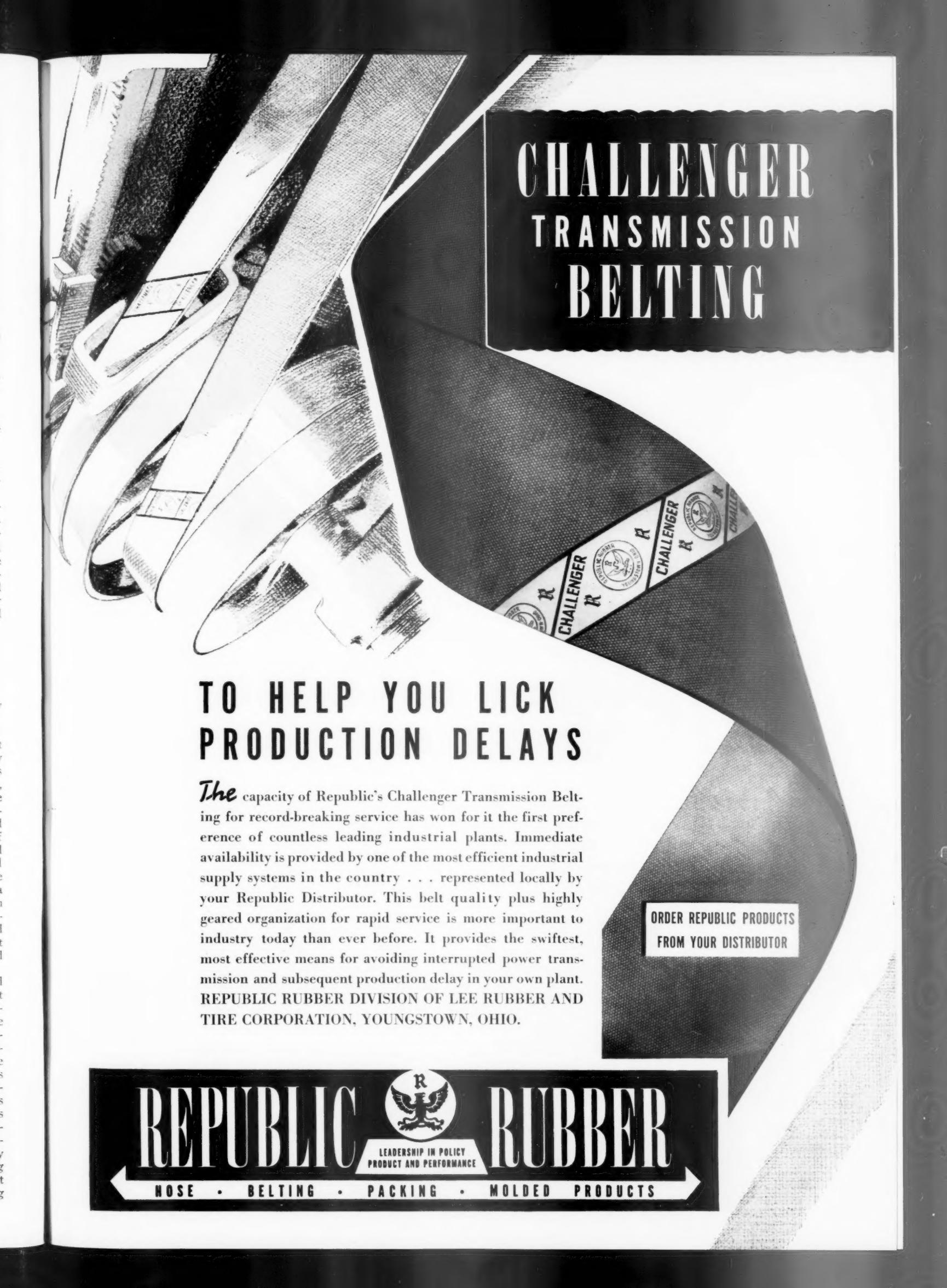
"License No. GBP 1 for potash; No. GBW 1 for copper; No. GBX 1 for brass and bronze; No. GBY 1 for nickel; No. GBZ 1 for zinc.

"All other articles and materials for which a license is required may be permitted to proceed freely to Canada under the appropriate general license listed above and without an individual license covering the particular shipment. Statistics concerning these exportations should be reported in the customary manner under the general license numbers listed above."

MASS PRODUCTION METHODS FOR SHIPBUILDING

According to Frank E. Ames, safety department manager for Lykes Bros Steamship Co., New Orleans, the production of destroyers and merchant vessels to meet the present emergency need not involve insuperable difficulties if mass production methods are applied, similar to those developed during the World War. Mr. Ames, who was associated with the Mare Island Navy Yard at that time, recalled the building of the destroyer *Ward*, which was launched in 16½ days in 1937, and was completed for trial 30 days later. Prior to that time the best record in the construction of a destroyer from keel laying to completion ready for trial, was fourteen months—at the Bath (Maine) Iron Works, and thirteen months for a duplicate of that destroyer constructed at the Mare Island Yard in 1916.

Shortly after the United States entered the World War, it was determined that the Navy needed approximately 200 destroyers of the 1,200-ton class, the type that had just been completed. The construction of sixteen of these was allocated to the Mare Island Yard. The yard had ample supplies of steel plates and shapes available, and it was determined to apply mass production methods as far as possible. When plate work was started, sixteen of each mark and number were made and stored. Construction became virtually an assembly process, the flow of units proceeding smoothly and steadily, thanks to expert stowage and detailed records showing where each part was located.



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RATED STEEL CAPACITY 84 MILLION TONS

New data on steel ingot capacity, issued by the American Iron and Steel Institute, indicates that 1941 production may exceed the 1940 output by as much as 15 million tons, without taking into consideration new facilities which will come into production during the year. The capacity of the industry, as of December 31, 1940, is placed at 84,148,000 net tons of open hearth, Bessemer and electric steel ingots, an increase of 2,534,000 net tons as compared with the capacity rating a year earlier.

Weekly records of tonnage output are now calculated in terms of the new rating, showing expansion of operations actually in excess of that indicated in a direct percentage comparison. Output during the last week of January, for example, is listed as 97.1% of the new capacity, whereas on the basis of 1940 ratings, the same tonnage would have been slightly in excess of 100% of capacity.

The capacity ratings include allowances for normal shutdowns due to repairs and other factors. Because these elements have been taken into consideration, many observers are of the opinion that it would be possible for the industry to operate at 100% of capacity for an indefinite period of time. If the industry could achieve operations of close to 100% of capacity for the year, under the pressure of the current emergency, the output would be 84,148,000 tons, as noted above, as compared with 65,246,953 tons in 1940.

The highest yearly average of operations was recorded in 1929, at 89.05%. In that year the average exceeded 90% in eight months, and for four consecutive months it held at over 97%.

HAGERTY PROMOTED

J. W. Hagerty has been appointed Assistant Purchasing Agent of the Pennsylvania Railroad Company at Chicago. Mr. Hagerty has been with the company since 1901, and was office manager of the purchasing department at Philadelphia prior to his present appointment.

MORROW IS APPOINTED

H. C. Morrow has been appointed Purchasing Agent and Traffic Manager for the Unit Rig & Equipment Co., Tulsa. He was previously associated with the Gulf States Utility Co. at Beaumont, Texas, and with the American Republics Corp. and the Simms Oil Co. at Dallas.

R. F. Keck, formerly (1923-1935) deputy Purchasing Agent for the City of Albany, N. Y., has been appointed chief of the Social Security Division, 14th Internal Revenue Department.

Byron J. Rockwood, for the past four and a half years City Purchasing Agent at Saginaw, Mich., has resigned to accept a position as Village Manager at Grosse Pointe, Mich.

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Bethlehem Pipe made by the Continuous-Weld Process for complete uniformity, is available either black or galvanized in all sizes up to 3 inches in diameter. Beth-Co-Weld is furnished in exact 21-foot lengths, plus or minus one inch. Larger sizes of Bethlehem pipe are available up to 16 inches, outside diameter.

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More than 3500 different headed and threaded products are included in Bethlehem's complete bolt and nut line. Among Bethlehem bolts are: machine, carriage, lag, tap, hanger, elevator, plow, stud, track, hook, Dardel, button head and many others. Nuts are furnished hot forged, cold punched, oil quenched, and in other special types.

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NATIONAL SUPPLY COMPANY APPOINTS WIETERSEN



R. C. Wietersen, formerly associated with the Hercules Motors Corporation has been appointed Director of Purchases for The National Supply Company, Superior Engine Division, with offices at Springfield, Ohio, and Philadelphia, Penna.

COPPER AND ZINC SUPPLIES

In a statement issued January 16th, C. Donald Dallas, President of Revere Copper and Brass Incorporated, urged that steps be taken now to assure adequate supplies of copper and zinc.

Mr. Dallas stated:—

"Promptly on the outbreak of the war, almost a year and one-half ago, Revere began a program of expansion at all its plants to enable it to greatly increase its production of sheet brass, an absolute essential for cartridge and shell cases. Export orders, principally British, took up this expansion as rapidly as it was available. Now our own Government's requirements are superimposed on this in enormous quantities, and it is going to be necessary to still further and substantially increase productive facilities on sheet brass.

"Even at our present capacity production, running six days a week, three shifts, we are facing a shortage of raw materials. There simply isn't sufficient copper and zinc available in the country to supply the demand. Substantial increases in productive capacity now under way will make this condition extremely serious.

"Copper mines in the United States are operating at capacity, yet stocks are being reduced at the rate of about 20,000 tons a month, and there is practically

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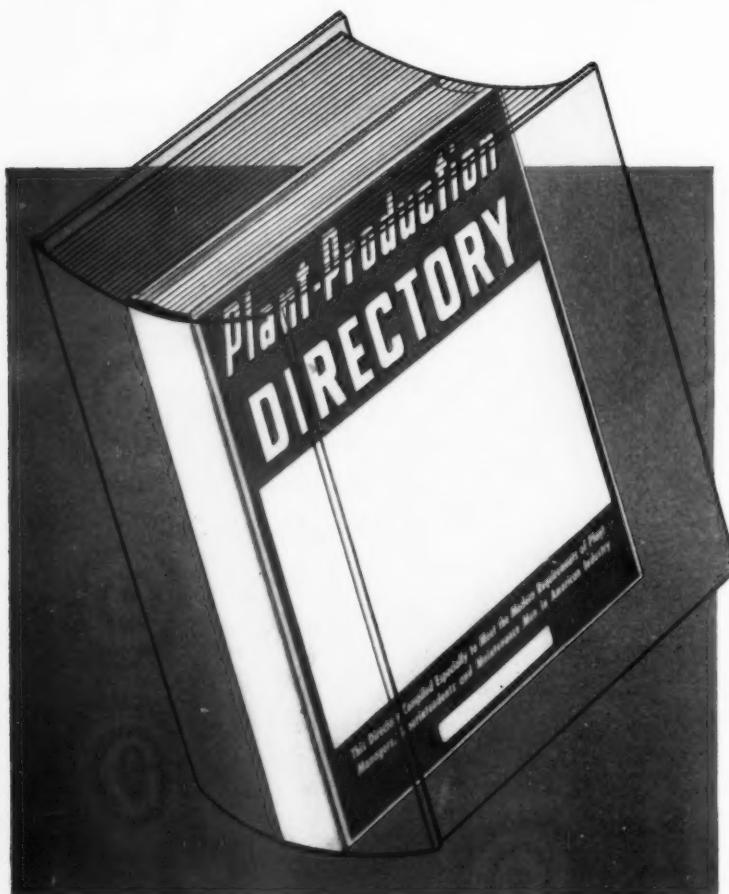
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The new high-speed four-column page and easy-to-read typographical construction of the Plant-Production Directory helps you find the proper classification of industrial products in a jiffy! There are no unnecessary listings of manufacturers under cross references to confuse you—waste valuable space and time. But every possible term is listed as a cross reference. No matter what you call the product you're looking for, you'll find the right classification in a few seconds!

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How could we get all this information in so small a volume? Department heads of leading industrial firms all over the country helped us weed out over 90% of the conventional listings. We reduced 40,000 classifications to less than 3400, without omitting one important fact. Result: information on industrial products is more complete in Plant-Production Directory than in any other directory in the industrial field!

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no copper for sale at the present time. Hence, buyers are bidding premiums for what small lots are offered.

"The Government has recognized this condition to the extent of arranging to bring in 100,000 tons of copper at the rate of about 14,000 tons a month, starting in March. This copper will be used for United States Government requirements, and to that extent will relieve the domestic situation. This, however, is not going to be adequate.

"The copper situation can be met promptly in one of two ways—either by increasing this tonnage, or by reducing the present tariff from 4c to 2c a pound. This would probably be quite feasible, either by the Tariff Commission finding that the difference in cost between United States production and foreign production was only 2c a pound instead of 4c and on the basis of such findings reducing the present tariff to 2c; or by the State Department making a reciprocal treaty with some country, for instance Mexico, making the tariff 2c a pound which would automatically bring in Chile under the most favored nation clause on the same basis. Over this barrier copper would flow freely and at the same time there would be adequate protection for United States producers.

"On zinc the situation is still more acute because there is a bottleneck both in Prime Western and in the refined grades necessary for the manufacture of cartridge brass. The current estimate that the consumption of zinc will increase from around 600,000 tons in 1939 to around 800,000 tons in 1941 falls far short of the mark. The probability is that the consumption of zinc this year would well exceed 1,000,000 tons if it were available, and in 1942 as new brass mill production comes into the picture, the requirements will be far in excess of this.

"On zinc there is no quick and easy solution as there is for the copper situation. To obtain required quantities of refined zinc means the building of new smelters and refineries. These take time to build after they are contracted for. It is only by recognizing these problems at once and in a realistic manner that there is any hope of their solution."

Joseph Reilly, New York Purchasing Agent for the Mallinckrodt Chemical Works, addressed the annual sales meeting of that organization on "The Purchasing Department."

Joseph H. Verheyden, Purchasing Agent for the Wisconsin Light & Power Co., Madison, Wis., has retired from active business after a half century of service in the utility industry. His associates entertained him at a testimonial dinner, and presented him with a gold watch and chain in recognition of his long and able service. He had been Purchasing Agent since 1919. C. J. Zweck, formerly head of the stores department of the company, succeeds Mr. Verheyden in the purchasing office.

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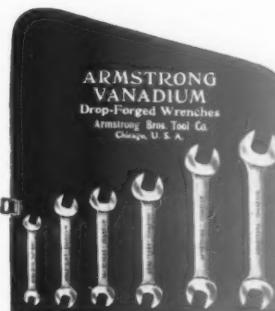


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WIREGRID belt hooks have the patented blue aligning card that holds hooks firmly in position, prevents them from loosening, prevents hook loss from handling, prevents waste of short ends. Every WIREGRID Hook to the last one can be used.

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The new Star Unbreakable Special Flexible is the fastest cutting, longest lasting flexible blade there is. Teeth so hard and sharp that it cuts like an all-hard — so tough that stripping is eliminated — yet so flexible that this blade is guaranteed unbreakable in use in a frame.

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PACKAGING EXHIBIT IN APRIL

A program that will consider all of the principal developments and the likely trends in the field of packaging, packing and shipping is being planned for the Conference that will run concurrently with the 11th Annual Packaging Exposition at the Stevens Hotel in Chicago, on April 1-4. Both the conference and the Exposition will be sponsored by the American Management Association.

Planned by committees of executives from various industries, the Conference, which each year attracts hundreds of executives from companies dealing in packaged merchandise, will cover the most practical phases of the packaging production and shipping processes. Special attention will be given to the impact of the national defense program on packaging and the currently indicated need for substitute materials and more extensive standardization of design. Keen discussion is also expected to center around the topic of "The Economy of Packaging" which will cover such matters as the cost of packages in relation to the value of their contents, design changes, etc. Extension of container capacities and methods of controlling container costs are among other topics that will be featured.

Henry J. Howlett, Secretary of the American Management Association, in charge of planning the program stated that the Conference will have three important features: (1) There will be no concurrent sessions; (2) there will be a large representation of Mid-Western packaging, packing and shipping people on the program; and (3) the papers and discussions will have a decidedly "technical" flavor.

The elimination of the concurrent sessions plan, a feature of past Packaging Conferences, will make it possible for individual registrants to participate in all sessions; preponderance of Mid-Western packaging men on the program is expected to cause the sessions to be in terms of the packaging problems of the Mid-Western industrial area, from which the greater portion of the registrants will come; and the emphasis on technical papers will create the most lasting contributions to the knowledge of packaging and packing and shipping.

As presently planned, the Conference will open on Tuesday morning, April 1, with a paper by an industrial executive devoted to "A Case History of Informative Labeling", which will describe the experience of one company which has intensively investigated the subject of informative labeling. This will be followed by a discussion of "The Economy of Packaging," in which will participate: a manufacturer, a dealer and a consumers' representative.

On Tuesday afternoon the Conference will give its attention to the defense program and will consider its bearing on various packaging processes. Executives from different industries will report on the uses of: metals, plastics, glass, paper, transparent sheets, machinery and design, and production.

Wednesday, April 2, will be devoted to packaging machinery problems. During the day, papers will be presented on such topics as: Progress in Vapor and Moisture Proofing; Visibility as a Factor in Package Design and Merchandising; the Standardization of Container Capacities; Manual vs. Machine Operations for Lower Costs.

A luncheon on Wednesday, at which Alvin E. Dodd, President of the American Management Association will preside, will be addressed by an English packaging executive on the subject, "Packaging in the Warring Countries."

Packing problems will be considered on Thursday, April 3. The topics tentatively listed for discussion on this day are: A Program to Control Container Costs; Corrugated Board and Its Component Parts as Engineering Materials; Packing Specifications on Army and Navy Shipments.

On Thursday afternoon the Conference will give its attention to a clinic on shipping containers. Representative corporations in various lines will submit their shipping containers to the registrants for critical examination. Each container will be dissected and analyzed for its merits in terms of the product that it contains.

1 1 1

INDUSTRIAL TRUCK PRODUCTION

December 1940 domestic bookings of electric industrial trucks and tractors continued the upward trend of the past year and were the highest in any month for a number of years, figures just released by The Industrial Truck Statistical Association, 208 South La Salle Street, Chicago, Illinois, disclose. There were 301 units booked as compared with 249 in November.

Total net value of chassis only booked was \$1,069,902.75, compared with \$827,003.73 in November.

Cantilever trucks totalled 270 units, with capacities and base prices ranging from 1000# to 20,000# and \$1750 to \$12,390, respectively, and had a total net value of \$973,615.25. All net values given are at factories, after additions and deductions for variations from standard specifications, trade-in allowances, etc. when applicable. There were also 14 Non Elevating Platform Trucks with capacities and base prices ranging from 2000# to 6000# and \$1630 to \$2650, respectively, with a total net value of \$31,622.50; 8 Crane Trucks, capacities and base prices ranging from 3000# at 7 ft. to 6000# at 7 ft. radius and \$4980 to \$5840, had a total net value of \$41,450; 6 Tractors, capacities and base prices ranging from 475/2000# to 6000# Draw Bar Pull and \$1475 to \$3505, had a total net value of \$12,265; 3 Special Non Load Carriers with a base price of \$3,650 each, had a total net value of \$10,950.

1 1 1

George W. Ibbs has been appointed Purchasing Agent of the Columbia Recording Co., Bridgeport, Conn. He was formerly warehouse manager for the Raybestos Co.



Laboratory data, test samples, full information on sizes, lengths, colors, and prices will be forwarded immediately upon request.

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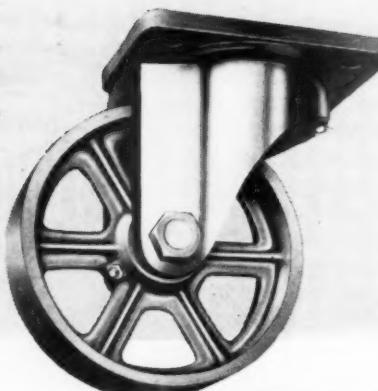
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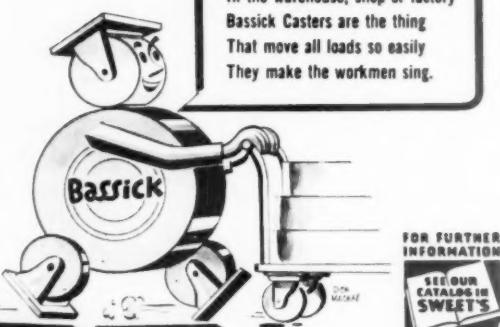
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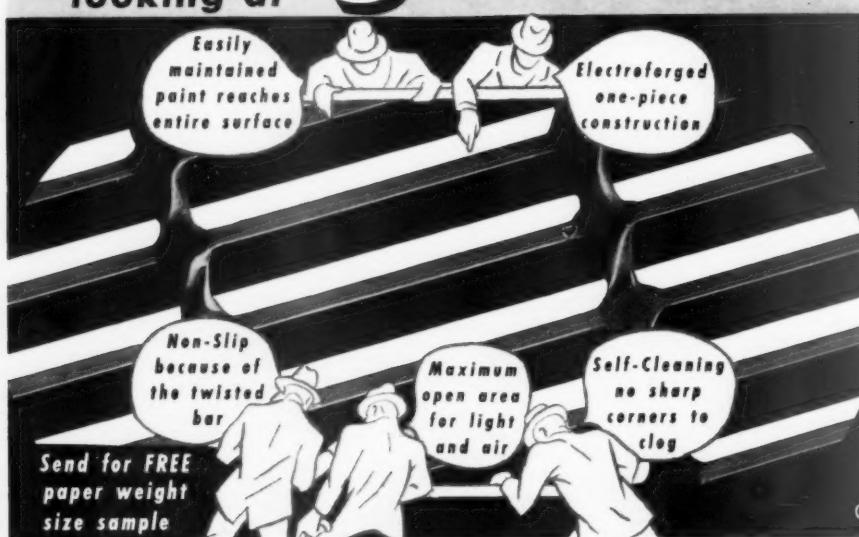
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CITY SALVAGE DEPT. IS PROPOSED

The establishment of a central salvage division by the city will result in the saving of thousands of dollars yearly mainly through the reassignment of equipment and materials, it is claimed in a report given to Mayor Maury Maverick by C. V. Nunn, City Purchasing Agent at San Antonio, Texas.

Nunn, who studied central salvage division systems in other cities before making his report to the mayor, said that all departments of the city would benefit greatly through the setting up of a salvage division here.

As an example, he pointed out that the river beautification project, which will soon be completed, has several hundred dollars worth of equipment and materials on hand that will be accessible to the city.

Material Re-assigned

This equipment and material, which consists of second hand lumber, small machinery and tools of all descriptions, will probably be stored at the completion of the project and perhaps much of the material will deteriorate.

But under the salvage system, this equipment would be taken to the salvage storehouse owned by the city and there re-assigned to other departments, as the street department or park department.

Under the present system, each city department maintains its own equipment which is not usually accessible to the other departments.

Nunn explained that by the re-assignment of the equipment to the other departments of the city, it could be kept in almost continual use.

Wheelbarrows Bought

As another illustration, Nunn said the sewage department recently had a work program whereby several wheelbarrows were purchased. After the wheelbarrows were used on the project they were put in storage, and will deteriorate if not used soon.

These wheelbarrows, under the proposed salvage division system, would be re-assigned, perhaps to the La Villita project, said Nunn.

He pointed out that materials such as lumber, pipe, plumbing fixtures and office equipment, in many instances considered as junk by one department, might prove of practical value to other city departments which would only have to requisition for the equipment under the proposed system.

Another advantage listed for the setting up of a central division would be that the city would receive better prices for such materials and equipment which the city could not use.

Nunn pointed out that a salvage division supervisor would become familiar with market conditions, prices, outlet and recovery methods and would be better qualified to make appraisal for comparison of value with the prices offered.

The City Purchasing Agent said he studied in particular the salvage division of the city of Los Angeles and

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found that it was meeting with great success.

Numm, who was asked to make the survey and report by the mayor, indicated that this division, however, could not be set up under the budget for this fiscal year because of the many demands on this budget at present.

GEORGE E. CULLINAN RETIRES
FROM GRAYBAR VICE PRESIDENCY

Effective December 31, 1940, George E. Cullinan, Senior Vice President, retired from the Graybar Electric Company, Inc., having completed thirty-nine years and five months of active service.

After his graduation from Williams College in 1901, where he was a star at baseball, football and track, setting a college record for the hammer throw and winning All-American recognition for his gridiron prowess, Mr. Cullinan joined the Statistical Department of the Western Electric Company. His record with the company has been one of steady advancement. After filling several jobs at the New York distributing house, he became chief storekeeper holding that position until 1907 when he was transferred to the St. Louis branch.

Mr. Cullinan continued to advance rapidly in St. Louis. He became Assistant Manager in 1908, Manager the following year, and then Western District Manager. A transfer to Chicago followed where he was successively Manager of the distributing house there and Central District Manager.

When the Supply Department became a distinct organization of the Western Electric Company in 1923, Mr. Cullinan returned to New York as its General Sales Manager. In 1926 he became Vice President in charge of sales of the Graybar Electric Company which replaced the Supply Department of Western Electric, and in 1940, he was made Senior Vice President.

In addition to his activities for Graybar, Mr. Cullinan has been unusually active in association and civic work. He has served as Chairman of the National Electrical Wholesalers Association, has been active in several Chambers of Commerce, and has served on the Executive Committee of the National Electric Light Association and the Society for Electrical Development. Mr. Cullinan has also been a member of many clubs including: Missouri Athletic, Algonquin, Sunset, University (Chicago and New York), Union League (Chicago), Lotos, Bankers, Park Hill Community, Geneseo, Hudson River C. C., and the Williams Club (New York).

An outstanding event in Mr. Cullinan's career was the selection of Mr. Cullinan in 1930 for the McGraw award. The citation for the award was "For persistent and unselfish labor for the education of the Electrical Industry in the Economics of Distribution."

Francis X. McKinnon has been named to the newly created post of City Purchasing Agent at Providence, R. I.

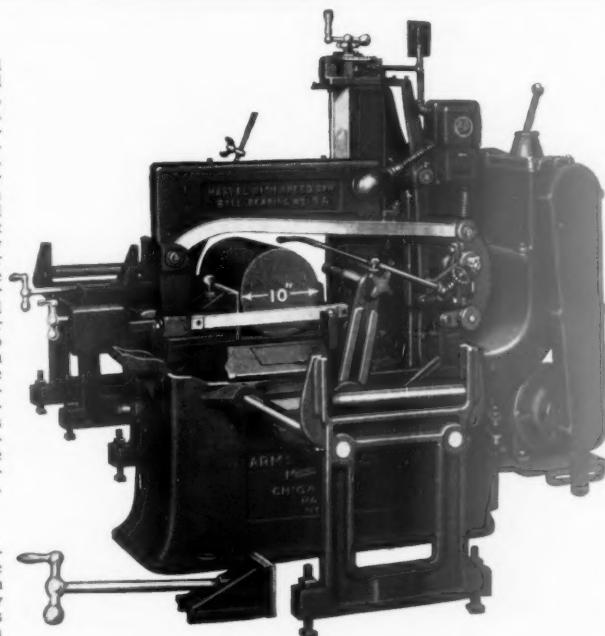
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MARVEL 6A and 9A Automatic Hack Saws Stand Alone

For automatic high speed production of identical lengths cut from bars, MARVEL 6A and 9A heavy duty, all-ball-bearing saws are unequalled. They will cut off more pieces per hour (from long rifle barrels to thin gear blanks) and will produce them at lower cost than by any other method. Built for speeds, feeds and blade tensions impractical for other saws and equipped with an automatic bar push-up, they require no more attention than an automatic screw machine —will continue to cut off identical pieces automatically until stock is exhausted or until automatic stop trips at the predetermined point. Operate to close tolerances.

Also serve as fast, efficient, general purpose saws. Bar push-up can be disengaged at any point, miscellaneous cuts made, and production work resumed by disengaging and re-engaging push-up.

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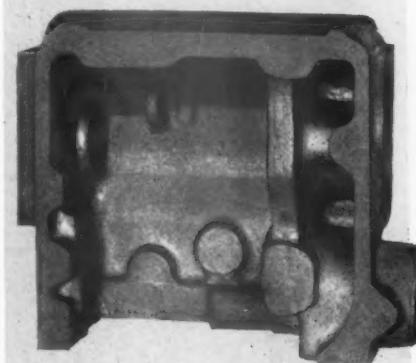
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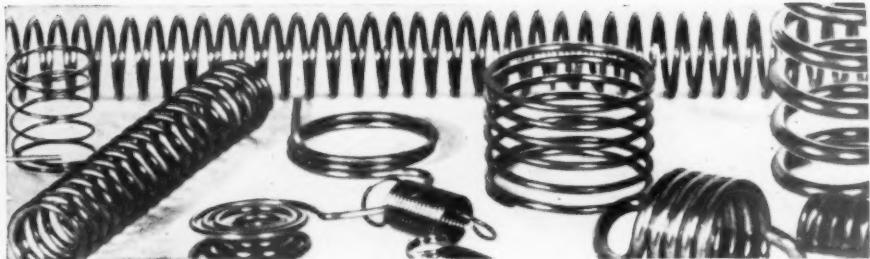
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This wide diversification is backed by 50 years of casting experience —at your call for any type of soft gray iron, high test semi-steel or alloy semi-steel castings.

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PHOSPHOR BRONZE
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AND
TYPEWRITER
RIBBONS**

OBITUARY

E. H. Bankard, 78, General Purchasing Agent for the Baltimore & Ohio Railroad for twenty years prior to his retirement from active business in 1920, died at his home in Sudbrook Park, Baltimore, January 1st. Mr. Bankard served for two years as chairman of the Eastern Regional Purchasing Commission of the U. S. Railroad Administration during the World War.

Thomas A. Duggan, 65, Purchasing Agent for the Atlas Powder Co., San Francisco, and for fourteen years an active member of the Northern California Association, died December 12th.

William P. Tinsley, Purchasing Agent, Secretary-Treasurer, and Director of the Lysaght Dominion Sheet Metal Corp., Ltd., Hamilton, Ont., died at his home in that city December 19th, after several months of ill health. Mr. Tinsley was a past president of the Hamilton Association and highly regarded as a leader among purchasing men in the Dominion.

Gordon J. Ratzow, 38, Assistant Purchasing Agent of the National Screw & Mfg. Co., Cleveland, died January 7th at his home in that city.

William A. May, 63, Purchasing Agent of the Morris Plan Bank of Cleveland, Ohio, since 1935, and formerly Purchasing Agent for the Brandt Co. of that city, died of a heart attack, January 15th.

Dante J. Gallina, 37, Purchasing Agent for the Memphis (Tenn.) Park Commission under four administrations, died at the Methodist Hospital in that city, January 17th, following an operation.

Edward Prentis, Jr., 52, for twenty years Purchasing Agent of the Corticelli Silk Co. and Brainard & Armstrong Co., died of a heart attack at his home in New London, Conn., January 19th.

Judson D. Woodward, 70, Purchasing Agent for Aiken County, S. C., died of a heart attack at his home in Columbia, January 20th. Mr. Woodward, who had served the county in various capacities for fifteen years and had never been defeated in an election for public office, was formerly cotton buyer for the Langley Mig. Co.

Harry C. Frey, 75, formerly Purchasing Agent for the General Railway Signal Co., Rochester, N. Y., up to the time of his retirement from active business ten years ago, died January 23rd after a brief illness.

Frank Combs, 61, formerly Purchasing Agent for the Red D Steamship Line, died at his home in Rockville Centre, Long Island, January 24th.

Henry H. Hoyt, 63, Assistant Purchasing Agent for the Inspiration Copper Company, died January 17th in a Phoenix (Arizona) Hospital, after a short illness. He had been associated with the company more than 25 years.

NEW SAFETY GLASS

A new safety glass having a strength of ten or more times that of ordinary automobile safety glass has been developed by the Pittsburgh Plate Glass Company, according to an announcement by R. B. Tucker, director of glass sales.

"The new glass, called Flexseal, was developed initially for use on stratosphere airplanes, whose pressurized cabins require strong and tightly sealed windows, which, if broken, will not leave the frame or release the cabin pressure. Because of its unique properties and many possible variations, use of Flexseal should prove advantageous in many other applications," Mr. Tucker said.

"In Flexseal laminated glass is combined the toughness, strength, and elasticity of a special plastic, and the hard surface, good vision, and rigidity of a special heat-strengthened glass. Like ordinary safety glass, Flexseal is a glass sandwich in which one or more thick slices of vinyl plastic serves as the 'meat', but in this case the 'meat' extends beyond the edges of the glass and serves as a flexible and rubber-like edge that can be bolted, screwed, or even nailed into window openings.

"If the glass is broken the thick plastic layers securely attached to the frame serve as an air-tight diaphragm, maintaining the inside and outside pressure differential.

"Flexseal laminated glass is the realization of a long dream by the glass industry for a mechanical method of fastening glass to other materials with a strong and air-tight seal. Flexseal, when bolted tightly in a frame, is not affected by localized stresses as has always been the difficulty with rigid glass.

"In effect, Flexseal is a plastic window on both sides of which is 'floated' a layer of glass. When installed, Flexseal has the appearance of an ordinary home or automobile window, but unlike present windows does not tend to break when the frame is twisted."

Selection of Rubber Belting

(Continued from page 57)

retards the penetration of moisture, acids and other deteriorating factors.

Manufacture of this type of belt naturally involves many difficulties, such as keeping the cords parallel during vulcanization, the correct vulcanization at press laps, and the proper joining at the ends. It is obvious that a belt of this construction would lack transverse stability due to the weftless nature of the cord plies. This, however, is compensated for in the design by the incorporation of two plies of a special high tensile fabric in the base, which not only provide the necessary crosswise strength, but work in conjunction with the cord in the load

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★ Before you went very far on your latest contract . . . defense or otherwise . . . you were confronted with a CONTROL PROBLEM. It's one you never met before . . . it STOPS you . . . perhaps for a day . . . a week . . . even months until solved.

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Many extraordinary control problems are quite familiar to GUARDIAN . . . and even things that have never been done before often yield surprisingly quick to the experience of Guardian engineers. Usually a combination of our stock items (more than 7,000) economically assembled into a control unit, relay, solenoid or automatic switch, will turn the trick for you.

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Guardian offers a specific solution. Send sketch or blue prints if available. Consultation, analyses and recommendations of Guardian's engineering staff are yours to command without cost or obligation.



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carrying capacity of the belt. The cord belt, in its most improved form can be joined with metal fasteners except when subjected to high lengthwise tension, in which case, as is true of any conveyor operating under such conditions, it should be vulcanized. With proper equipment and experienced operators, these vulcanized points are made so they become a permanent part of the belt itself.

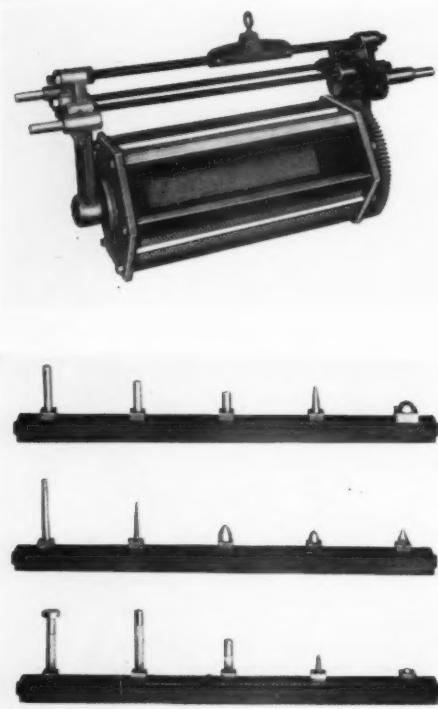
Improvements in rubber belting of various types during the last 20 years have almost revolutionized methods of power transmission and have greatly reduced the cost of handling materials. These improvements, however, have been so little standardized that the selection of rubber belting still remains a major problem for the buyer. Economy resulting from wise selection should justify a collaboration by the Purchasing Agent with the engineers of his plant in a careful study of the information provided by the belting salesman and the comparison and evaluation of performance data which he offers.

Industrial Diamonds in National Defense

(Continued from page 60)

must wait. Another motor, factory finished, must be ready and waiting to be placed in the plane, as soon as the old motor is removed. There must be no question about the fitting. The modern motor, of which enormous speed, flexibility and endurance are expected, is built like a fine watch. True, this fine instrument may have to be ruthlessly ruined if military necessity demands it, but who thinks of property when human life—yes, the very existence of human civilization as we know it—is at stake?

To make thousands of fine motors, the one precisely like the other, each capable of giving our valorous defenders the power and speed which they have a right to expect, requires diamonds. Pistons must slide in and out of cylinders with lightning rapidity; they must fit within clearances calculated in thousands of an inch—too great a clearance would shorten the life of the motor and cause the loss of compression upon which depends the speed of the plane with consequent loss of military efficiency and the lives of its occupants. Too small a clearance would cause complete break-



All H-VW-M Mercil Type barrel plating cylinders are rugged and simple. A wide versatility of design is available in a broad range of materials developed to give proper construction to meet different purposes. A greater variety of work can also be barrel plated because of the perfection of the various types of rib contacts as shown. Other contacts are available in the dangler, cone, disc and "T" types.

Above: standard bakelite plating cylinder, sizes 14" x 30", showing triple tie rod hangers and outboard support bearing on the pinion shaft.

At left: types of rib contacts available on H-VW-M plating cylinders.

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down of the motor with similarly disastrous effects. Diamond tools are essential to achieving this all-important mechanical accuracy.

Tanks are essentially but a special type of armored automobile. Their motors must operate with the same hair trigger accuracy as those in the passenger cars and buses which Americans have come to take for granted. As we have already pointed out, the automotive industry is one of the largest consumers of industrial diamonds. It is therefore scarcely a matter for surprise that the building of tanks, large and small, requires industrial diamonds for the same purpose.

Crankshafts and other moving parts are forged by machine, after which they must be ground by grinding wheels to perfect balance. After repeated use, these wheels must be reground with something much harder than the material of which they are composed. Again the industrial diamond fulfills its essential function. Even the huge machines on which all these operations are carried out require diamonds in their own construction. The fine mechanism of anti-aircraft, anti-tank, coast defense, and naval guns also necessitates the use of industrial diamonds. So does the drawing of the wire used in the ignition systems of motors of all kinds, and the filament in the lighting systems.

Conclusion

After citing these all-important uses of industrial diamonds, the American embargo on the export of industrial diamonds begins to assume a clearer outline. As long as we are able to obtain adequate supplies of diamonds from the world's primary sources, many of which are controlled by England, this country's defense needs will be adequately served.

1 1 1

Specifications for Service

(Continued from page 69)

in such a specification, the supplier would be able to check the use against the factors affecting endurance; to make a wise choice of grade and to process for maximum usefulness or detect any endurance weakness in the specified design.

Or assume a specification does give a kind and grade of metal. Several new alloys have been introduced into this field during the depression years, each one possessing certain characteristics suitable for the different conditions of service which may be encountered. If all these alloys and their special characteristics are known so they can be specified with certainty, there is no need to mention the usage. But if there is doubt concerning the one most suitable for a given application, then more good than



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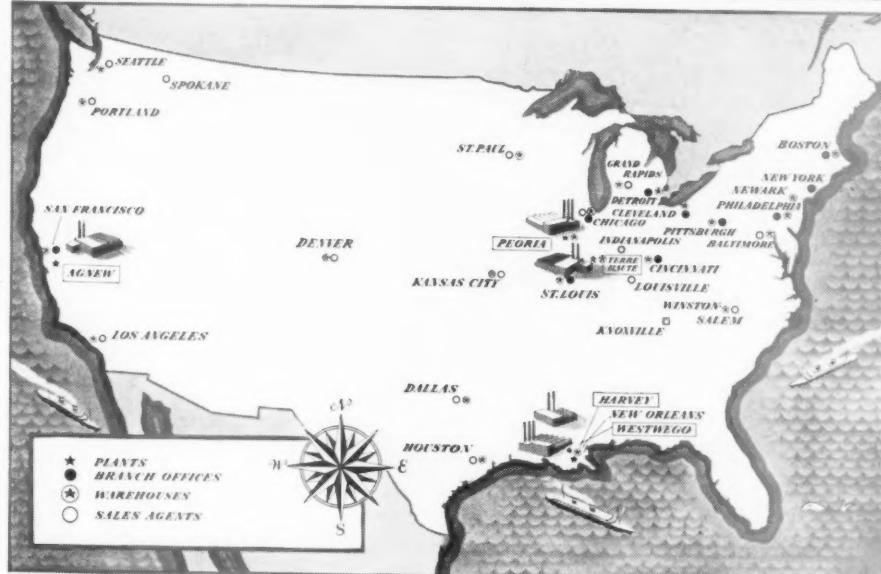
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harm can come of letting the supplier in on the secret of operating conditions.

For whole specifications enable a supplier to check the suitability of a product by use against dimensional, chemical or physical requirements set up in the specifications. Often within these specified limits, a supplier's knowledge or experience with similar applications, will immediately indicate that a run of product on the high or the low side of the limits will have greater endurance possibilities in the stated application. Or still working within the specified limits, one processing method may offer greater endurance possibilities in one application than it would in another.

Again, a supplier's greater familiarity with the many ramifications of his own product, will quickly spot an application in which the endurance possibilities would be increased by a change in the specifications. A supplier is usually glad to bring such instances to a buyer's attention for his further investigation before approval. In this way a specification may be kept in tune with the latest developments affecting a product.

Without sacrificing any part of their present specifications, buyers may work for the continued improvement of their purchases by thus engaging the co-operation of the suppliers technical staff. The tremendous forward strides made in recent years in hundreds of products have made it increasingly difficult to keep abreast of developments even for the specialist. So if our company organization is not large enough to em-

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For use in high temperature annealing furnaces welded baskets are recommended; also for pickling and plating or conveying operations they will lower unit production costs.

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Send for Jelliff Bulletin or if desired our sales representative in a nearby key city will call with detailed information.

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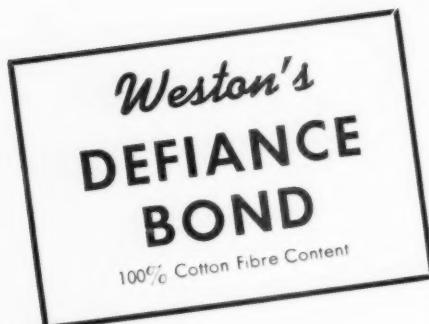
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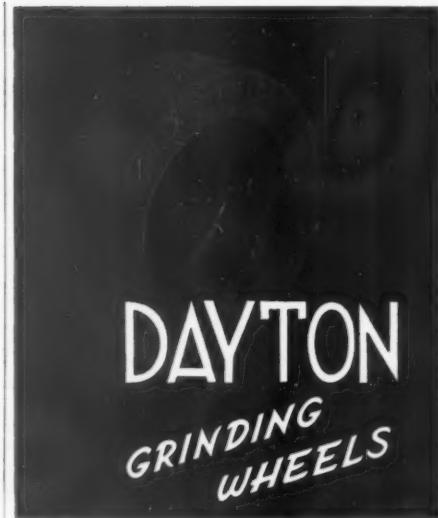
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and spark plugs, etc.; batteries, all kinds; conduit fittings (condulets); fuses; lamps, including miniature; motors; switches; excluding cables and wire (Class 73); conduit (Class 63); insulating compounds (Class 14); insulating paints and varnishes (Class 13). *Buying Period No. 3.*

Class 31-32—Machinery and Plant Equipment. Including boilers; compressors; engines; power cranes; pumps; road maintenance equipment; power shovels; and parts therefor; excluding steel buildings and tanks (Class 61); electrical equipment (Class 27). *Buying Period No. 7.*

Class 35-36—Auxiliary Plant Industrial Equipment. Including ball and roller bearings; beltings; boilermakers' markings, punches and rivet sets; chain hoists; portable electric and pneumatic tools; fire fighting, power transmission and welding equipment; indicating and recording instruments; jacks; lubricators; safety appliances (excluding wearing apparel, Class 02); snatch and tackle blocks; trolleys. *Buying Period No. 11.*

Class 42—Transportation Equipment. Including automotive, marine, hand and horse drawn conveyances; accessories and parts manufactured by equipment makers; pneumatic tires and tubes, and accessories, i. e., flaps, patches, valves, etc.; excluding



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FOR TOUGH JOBS Use Starrett S-M Molybdenum Special Alloy High Speed Steel Hacksaws for hard alloys or metals hard to cut with ordinary blades. These tough, fast-cutting, low cost blades were developed by Starrett for "trouble" jobs and are the result of special heat treating methods. Made in hand and power blade sizes.



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FOR ECONOMY. Starrett Tungsten Alloy Blades give complete satisfaction on all but the hardest jobs or where high speed cutting is essential. Low in price but in every way up to Starrett standards. Made All Hard, Flexible Back and Semi-Flexible for hand frames and for light and heavy power machines.

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Class 48—Railway Rolling Stock. Including railway cars of all kinds, and accessories; excluding locomotive cranes (Class 31). *Buying Period No. 12.*

BUYING DIVISION C

Class 54—Metal Stencils. *Buying Period No. 7.*

Class 55—Metals, Ore, Ingot and Bar. Including flats; half rounds; rounds; squares; octagons; babbitt; pig lead and tin; solder; welding rods. *Buying Period No. 12.*

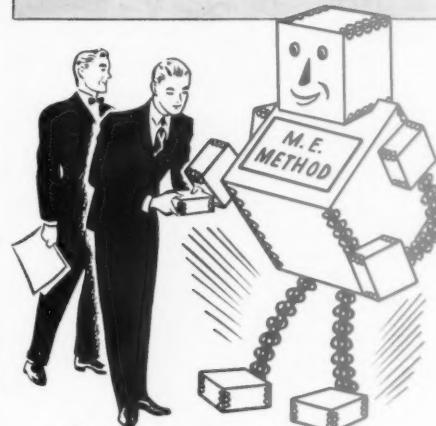
Class 57—Metals, Plates and Sheets. Including corrugated sheets; tin-plate. *Buying Period No. 11.*

Class 59—Metals, Structural Shapes. Including angles; T and Z bars; H and I beams; channels; steel rails and accessories, i. e., splice bars, frogs, switch plates, tie plates, stands and switches. *Buying Period No. 12.*

Class 61—Metals, Manufactures of, Not Elsewhere Classified. Including chain i. e., load, roller, tire and mending links; expanded metal; funnels; measures; oilers; pails; pipe clamps; porcelain enamelled specialties; reinforcing fabric; rope clips; seals; signs; steel buildings; steel cabinets (other than filing, Class 04); strapping; tanks and special fittings such as manheads, nozzles, vents,

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ALL MATERIALS



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Getting caught under gem clipped correspondence and going to UNKNOWN FILE causing serious delays and losses?

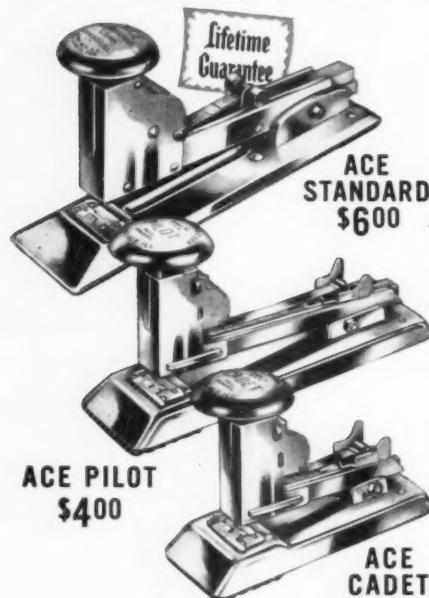
✓ JUMBLED ORDERS?

Coming in the mails from your salesmen, all mixed up and hard to decipher, causing mistakes, often wrong shipments?

✓ OUTDATED METHODS?

Using old fashioned methods to fasten things together when a stapler would save time and increase the efficiency of all?

ACE STAPLERS are necessary equipment for modern offices. They end such hazards once and for all. Try ACE for STAPLING—PINNING—TACKING! Check the results and you'll never be without one. They Guarantee a Lifetime of trouble-free service.



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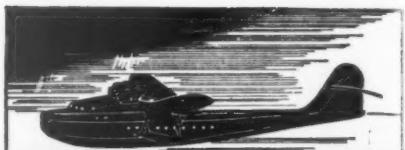
Class 67—Cocks, Valves, etc. Including auto filling nozzles and repair parts; barrel and tank wagon faucets; barrel fillers. *Buying Period No. 4.*

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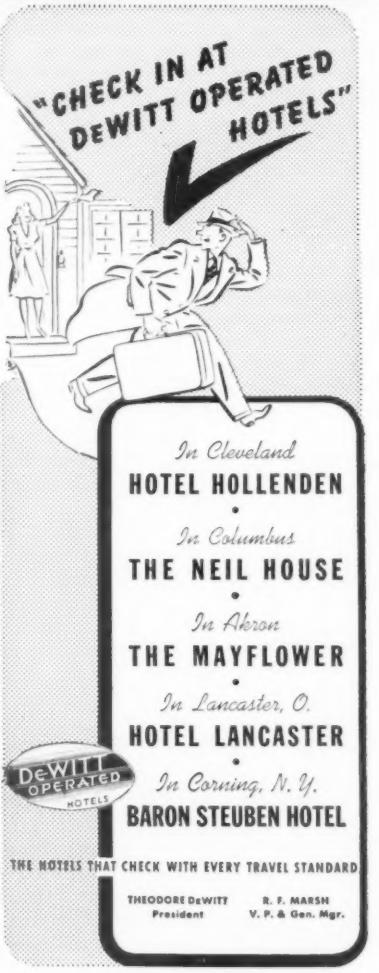
• the film protects the stencil! No cut-outs. No weakened fibers. Hence, extra strength, harder wear, longer runs.

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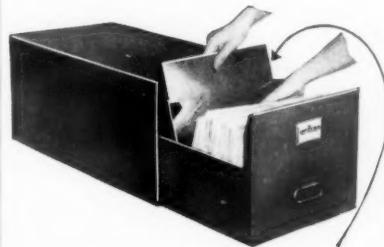
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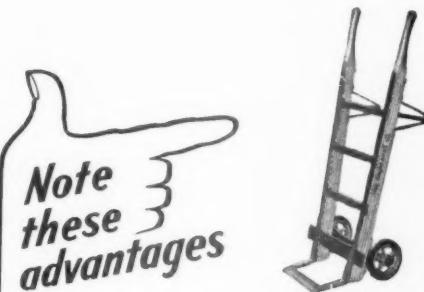
ORIGINATORS OF STEEL STORAGE FILES

and tumblers (Class 26); bottle caps; bung and vent plugs; tin-plate clips; drum flanges (Class 61); grease drum nuts (Class 70); kraft paper (Class 95); rubber gaskets (Class 77). *Buying Period No. 3.*

Class 77—Manufactures of Asbestos, Leather, Rubber, and Accessories, not Elsewhere Classified. Including brake linings; cork and leather discs; clutch facings; gaskets, all kinds; hose, all kinds, and fittings; piston leathers; packings, all kinds; rubber pump valves; excluding belting (Class 35); clothing (Class 02); insulating materials (Class 26); leather and rubber hammers (Class 19). *Buying Period No. 8.*

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Steel straps on both front and back of wooden frame.

Steel cross-bars bolted flush into top of frame, instead of into weakening mortises.

Nose iron can be replaced by removing only six bolts.

Wheels are slightly crown faced, minimizing chipping of edges, and making them less destructive to floors.

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Handles are wood, which are warm to the touch. Tapered frame gives a better balance.

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New PRODUCTS & IDEAS



BARREL TRUCK



barrel onto the truck and holds the barrel or container while it is in transit. The truck can be tipped back while loaded and rested on steel legs.

This ruggedly constructed unit has a capacity of 800 lbs. and is equipped with 9 wheels of semi-steel or rubber-tired; Hyatt bearing equipped in either case.

STAINLESS-SPRAYED RECONDITIONED PARTS

Spraying worn parts with stainless steel by a metallizing process and remachining to size, is producing reconditioned parts giving from 100 to 300 per cent their original service life on a well-known middle western railroad.

Many locomotive parts which would normally be scrapped are being reclaimed and reconditioned by this process—as well as such parts as shafts, water pump piston rods, motor armature shafts, etc.

Prior to the spraying, all surfaces to be sprayed are sand blasted, using a 30 mesh steel angular grit, which not only thoroughly cleans, but also roughens the surface and enables the sprayed metal to adhere to it. Spraying is to a depth of 1/64th to 1/32nd in. per side in excess of the size to which the part is to be machined.

To obtain the fine finish desired, it was found desirable to turn such sprayed metal finishes at high speeds—from 200 to 450 ft. per minute—with fine cuts and a slow feed. For turning operations, tools made by Carboloy Co., Inc., of Detroit, Mich., are therefore used. On parts that cannot be turned, the surfaces are finished by grinding from the rough.



■ For handling either full or empty bilged or straight-sided barrels, drums or cylindrical fiber containers with speed and safety. This barrel truck has been placed on the market by Barrett-Cravens Company, Chicago, Ill.

They are prevented from falling off by a double hook which aids the operator in tipping the barrel onto the truck and holds the barrel or container while it is in transit. The truck can be tipped back while loaded and rested on steel legs.

■ Developed especially for use in production plants, schools, pattern shops, furniture factories, contractors and other types of operations where full capacity is essential, the 10" tilting arbor circular saw manufactured by Yates-American Machine Co., Beloit, Wis., combines high efficiency with low cost. This unit has unusually large capacity for a saw of its size. It has a standard one-piece table 32" x 36", which provides for a cut-off capacity of 17" ahead of the saw on the table itself, 25" when front table extensions are used.

The saw arbor runs in sealed ball bearings which are lubricated for life. A simple, safe, yet highly efficient pin-type arbor lock is provided to enable the operator to lock the arbor securely when changing saw blades. The motor remains stationary while the arbor mechanism rotates around it. It is not necessary to hoist the weight of the motor along with the saw.

The heavy welded steel frame encloses all working parts including the motor. No extra guards are necessary to obtain this full enclosure. The entire unit is self-contained. The base itself acts as a hopper for saw dust. An opening is provided at the bottom of the base at the rear where the saw dust may be removed.

LATEX BASE CEMENT

■ A cement with a latex or rubber base, and compounded to afford exceptional adhesive properties and resistance to aging is announced by The B. F. Goodrich Company, Akron, Ohio. It contains no inflammable solvents.

The new product is of special interest to upholsterers, awning manufacturers, leather fabricators as well as to anyone having any requirement of adhesion of fabrics, paper, leather or other porous materials.

It also will attach fabrics, paper, and other materials to non-porous surfaces, and can be easily cleaned from these surfaces when its mission is accomplished.

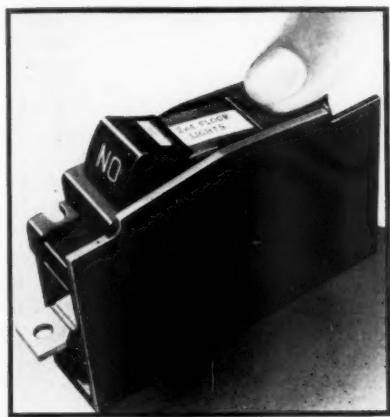
There are many non-industrial uses as an office paste, easily removed, leaving clean paper surfaces, for sealing packages, applying labels, posting bulletins. It also can



be applied as an anti-skid coating for rug bases, used to repair clothing and household furnishings, and to stop runs in hosiery.

Non-inflammable, with no objectionable odor, the cement can be stored in normal atmospheric temperatures, with avoidance of freezing temperatures or heat above 90 degrees.

AUTOMATIC CIRCUIT BREAKER



■ A combination switch and automatic circuit breaker for snap action—on and off manual switching—plus automatic opening on overloads or short circuits, is being marketed by Bulldog Electric Products Co., Detroit, Mich.

Since circuit breakers are controlled entirely through their handles, both for on and off switching and off switching and

re-setting after automatic opening, they have adopted a husky rocker handle so that the device can never become useless for lack of an operating handle due to breakage.

The overload control latch is a straight member without offsets or bends; thus assuring correct ampere calibration and improved operation. Ampere ratings of each breaker are plainly stamped on the face of the red indicator signal. The "load" terminals are solderless wire grips, silver coated. The "line" terminals and busbars to which they are connected, are also silver coated.

MILLING MACHINE

■ Designed for efficiency, versatility and economy on small-piece milling, the bench milling machine reflects careful study, sound engineering, and a thorough knowledge of current tool room and production requirements. This compact machine is the latest addition to the line of machine tools made by Atlas Press Company, Kalamazoo, Mich., which now include back geared screw-cutting lathes, single and multiple spindle drill presses, a 7-inch shaper, mechanical and hydraulic arbor presses.



This miller handles the full range of milling operations from heavy slabbing and facing to light end milling, keyways, finishing and layout work. Three types of table controls are available; standard screw feed, rapid-production lever feed, and the new "Changeomatic" for instant selection of automatic table feeds. A wide range of spindle speeds provides correct surface speeds for all types of work and cutters. Swivel vise, rotary index table, indexing centers, and coolant system are available.

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ONE HAND CONTROL

One hand controls the CM Comet—the other is FREE to guide the load into position.

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Fast, positive lifting and lowering of the load. Requires but a minute or two to hook up.

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Low initial cost... low operating cost. Just a few cents a day operates the Comet.

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No special outlets or wiring needed... just plug into the nearest outlet—then hoist.



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It's portable... easily removed and installed as it goes from job to job.

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NEW "HALF TON" LIFT TRUCK



■ Known as the "Half Ton", this unit being manufactured by Barrett-Cravens Company, Chicago, Ill., is a general purpose lift truck designed for handling office and supply room materials and a wide list of lightweight items in industrial plants and warehouses requiring lift truck equipment lighter than that available in the past.

It serves as a combination lift-truck with a full 2" lift for big loads that are

handled on skids and as a floor truck for bulkier single objects, barrels, cases, bales, tote boxes, small bins, etc.

The "half ton" is equipped with 4 ball bearing wheels. Front wheels are swivel type. "U"-type tubular steel handle lifts loaded skid when pulled down to an angle slightly more than 45°. Truck platform is lowered by easy pull on trigger chain and can be accomplished with a finger.

FLUORESCENT LIGHTING UNIT

■ No longer is it necessary to have selection of industrial overhead lighting units confined to drab finishes, nor to pay a premium for special attractive finishes to match existing interiors or equipment.

The Fostoria Pressed Steel Corporation, Fostoria, Ohio, is now making available their entire line of fluorescent and silver bowl lighting units in a variety of ten different colors for the outside finish.

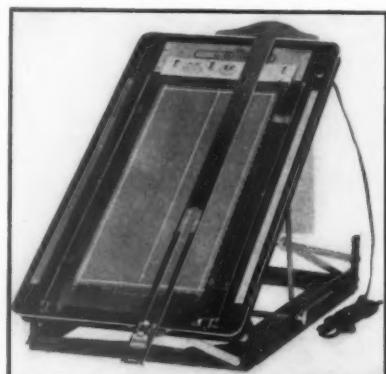
This feature is made possible by the fact that all finishes on the units are baked by the near infra-red process in ovens designed for this purpose. These ovens permit baking of special colors at a moment's notice.

ILLUMINATED DRAWING BOARD

■ Thirty-five improvements are claimed for the new illuminated drawing board produced by Remington Rand Inc., Buffalo, N. Y., to facilitate the tracing of images from the original in stencil, spirit and gelatin duplicating processes. Described as a boon to stencil users, the new device is also said to be helpful to photographers in blocking out negatives and in the drafting room where sections of various tracings are combined to make a composite drawing.

It is adjustable to eight lengthwise drawing positions and four sidewise positions, or it may be used flat on the desk or rested against the edge of it. All of these adjustments are possible without removing and replacing any legs.

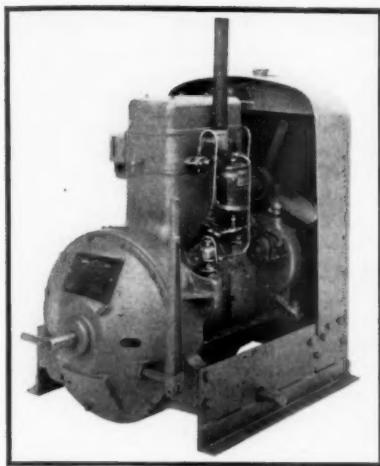
A "built in" lumiline light insures a uniform light supply from top to bottom of the flashed opal glass no matter in what position the device is being used. Two stencil clamps on each side slide up and down on a "built-in" track and



are locked in position by a simple lever attachment. It is built as a single unit so that there is no possibility of any parts becoming mislaid or lost.

The T-square and locking clamp are also one unit and may be used lengthwise or crosswise without removing the clamp. It may be moved from top to bottom or from side to side without hitting any obstructions as the stencil stub plate, stencil clamps and light switch are below the working surface and out of the way.

SMALL DIESEL ENGINES



■ The Stover Manufacturing & Engine Company of Freeport, Ill., now have ready for delivery a line of Diesel engines, equipped with the Lanova combustion chamber, that develop more power per cubic displacement and per pound, and that can be sold at proportionately lower cost.

These Diesels are smoother running and more economical to operate. They now are available in four sizes and with a

variety of mountings. The 7½ hp. and 10 hp. models are single cylinder. The 15 hp. and 20 hp. models are of the twin cylinder type. The illustration shows the conventional stationary type of mounting. The twin cylinder models have No. 1 Bell housing.

HOIST FOR LIGHT LOADS

■ For hoisting light loads up to 700 pounds Ingersoll-Rand Company, Phillipsburg, N. J., has introduced the Air-Bloc. It is a flexible, welded, link-chain air hoist designed for use in machine shops, assembly lines, maintenance shops, shipping and receiving departments for light lifting jobs practically everywhere.

It is available in three sizes which are designed to handle loads of 300, 500, and 700 pounds respectively.

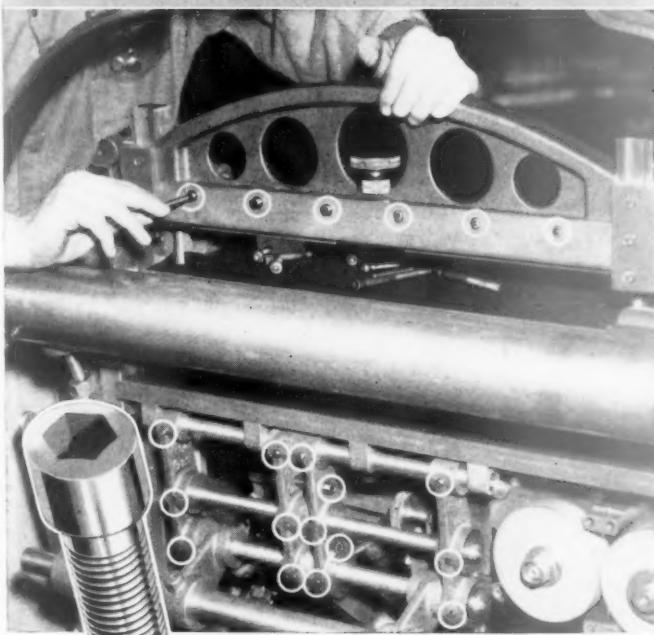
It weighs less than 75 pounds and can easily be moved from one job to another. An automatic up- and down-stop control prevents damage to the hoist from over-run of chain in either direction. Another safety feature prevents the load from dropping even if the air supply fails.

LIGHT-DUTY TRUCKS

■ Of special interest to users of light-delivery and light-duty trucks ranging in rated capacities from ½ to 1½ tons is the announcement of a line of five models in that capacity range by International Harvester Company, Chicago, Ill. The new Internationals are: the ½-ton model K-1, ¾-ton model K-2, 1-ton model K-3, 1½-ton model K-4, and the 1½-ton model K-5. Wheelbases range from 113 to 177 inches and gross vehicle weight ratings from 4,400 to 13,500 pounds.

Outstanding among many important mechanical features of the trucks is the "Green Diamond" engine which, in three sizes, powers the five new models. Exhaustive research and an extensive and far-reaching testing program have proved the ability of these engines to provide more power with improved performance and remarkably greater fuel economy.

"There COULDN'T BE a bad P-K Socket Screw!"



**-Says Machine Builder
After Visiting Parker-Kalon
Quality-Control Laboratory**

"My inspection trip through your quality-control department amazed me, and certainly settled the question of which socket head cap and set screws we could trust to stand the heavy torsion and other strains in our automatic spiral inserting machine," states an executive of the Spiral Binding Co. "After seeing those tests, I felt that there couldn't be a bad P-K screw . . . and in two years we have never had one fail in service or give trouble in assembly."

No less than sixteen exacting tests in the unique Parker-Kalon Quality-Control routine prevent the troubles a few "doubtful"—imperfect—screws in a lot can cause. Wise design and production men are getting the benefit of this extra protection on all fastening jobs by specifying PARKER-KALON exclusively.

WRITE today for folder describing the great Parker-Kalon Laboratory which makes it possible to maintain a new high standard in socket screws without increasing the cost. Free samples furnished on request. Parker-Kalon Corporation, 202-204 Varick Street, New York.

Quality-Controlled

16-point test and inspection routine covers: Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance under Tension and Shear; Hardness; Head diameter, height and concentricity; Socket shape, size, depth and concentricity; Class 3 Fit Threads; Clean-starting Threads.



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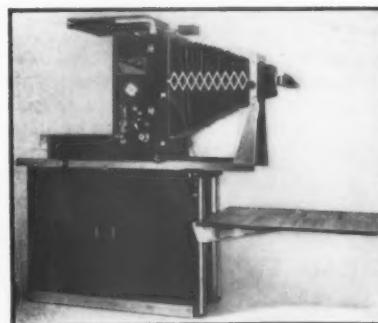
... says Mr. S. F. Heinritz,
Editor of Purchasing Magazine

Nobody knows the myriad headaches of the purchasing agent better than S. F. Heinritz, Editor of Purchasing Magazine. One of the biggest problems is getting those rush orders, *where* and *when* you want them. Mr. Heinritz says Air Express is the answer. Three-mile-a-minute speed in the sky is co-ordinated with *special* pick-up and *special* delivery on the ground—at *no extra charge* within our regular vehicle limits in all cities and principal towns. Co-ordinated air-rail service. So make a note now...to specify shipment via Air Express for those important orders from the factory or wholesaler. For service phone RAILWAY EXPRESS, AIR EXPRESS DIVISION.

AIR EXPRESS

The Sky Speed-way for Purchasing Agents

PHOTOCOPYING MACHINE



■ The original photocopying machine, designed to copy exactly (by photography) anything written, printed or drawn in actual, reduced, or enlarged size, is manufactured by The Haloid Co., Rochester, N. Y.

The model shown photographs the subject, develops and fixes prints within the machine. New exclusive Bausch and Lomb lens and prism assure absolute accuracy. Other features help produce fine copies, speedily, efficiently and economically. Especially designed for industries and businesses requiring copies of plans, correspondence, contracts, etc., on short notice at low cost.

GUMMED PAPER

■ The one outstanding feature about the Sparklekote gummed paper produced by McLaurin-Jones Co., Brookfield, Mass., is its high receptivity to printing, as well as to pen and ink. It is the answer to the current demand for glossy printed labels, and is also adaptable for many other types of work where a sparkling, live sheet of gummed paper is required.

This can be furnished in thirteen various shades and tints, in addition to white. The range of colors runs from the dark shades of red, green and blue to the very delicate ivory and primrose shades. Sample books covering this line are available and will be sent upon request.

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FORK TRUCK



■ A lifting, carrying, tiering fork truck that will handle loads as heavy as 7,000 lbs., and tier them in piles 15 ft. high and higher, has been introduced by Clark Tractor Division of Clark Equipment Co., Battle Creek, Mich.

This truck is said to be particularly efficient in car loading and unloading operations, in utilizing storage capacity to the full by high stacking and in serving production machines with materials and parts from storage. Gas-powered, it is capable of 24-hr. continuous operation.

Is made in several models including straight lift, tilting and telescopic tiering. Minimum height is 6 1/2 in., enabling the truck to negotiate low doorways. Minimum capacity is one ton. Heavy steel fingers, with chisel points, vary in length and are adjustable sidewise on the front plate. The operator inserts these fingers under any cleated or uncleated load, lifts the load clear of the floor, tilts it back 10 deg. in 1 sec. for safe riding, elevates it at the rate of 7 in. per sec., tilts it forward 3 deg. in 1/2 sec. for easy tiering.

FLEXIBLE BLADE

■ A flexible tungsten alloy hack saw blade, possessing cutting qualities hitherto unobtainable in a flexible blade has been announced by Victor Saw Works, Inc., of Middletown, N. Y. The blade cuts as well as an all-hard tungsten blade, yet is so extremely flexible that it cannot be broken in use

**QUALITY
Plus ECONOMY**

Victoria
TOILET TISSUES

NOW
AVAILABLE
IN BLEACHED
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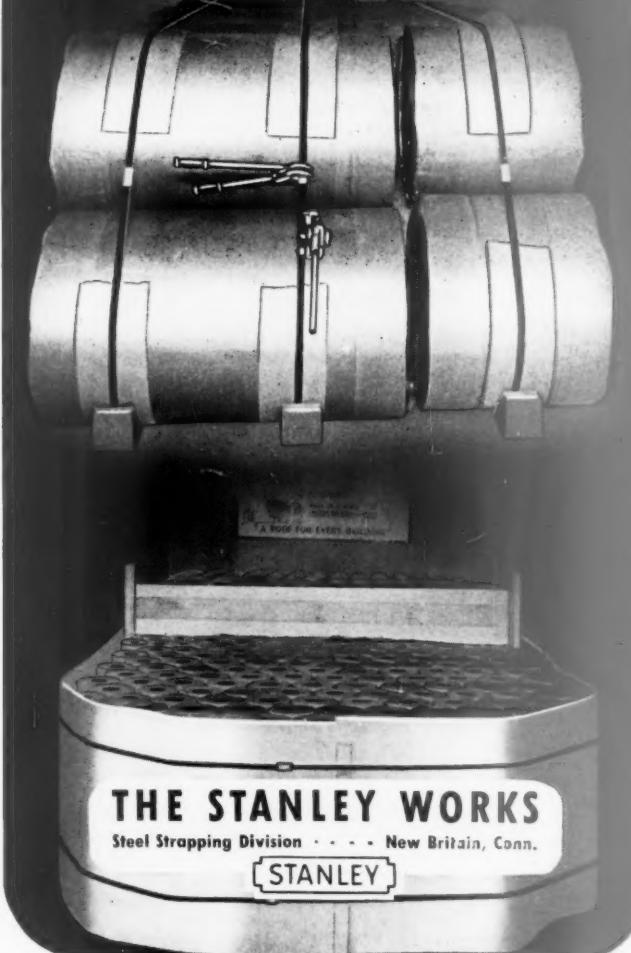
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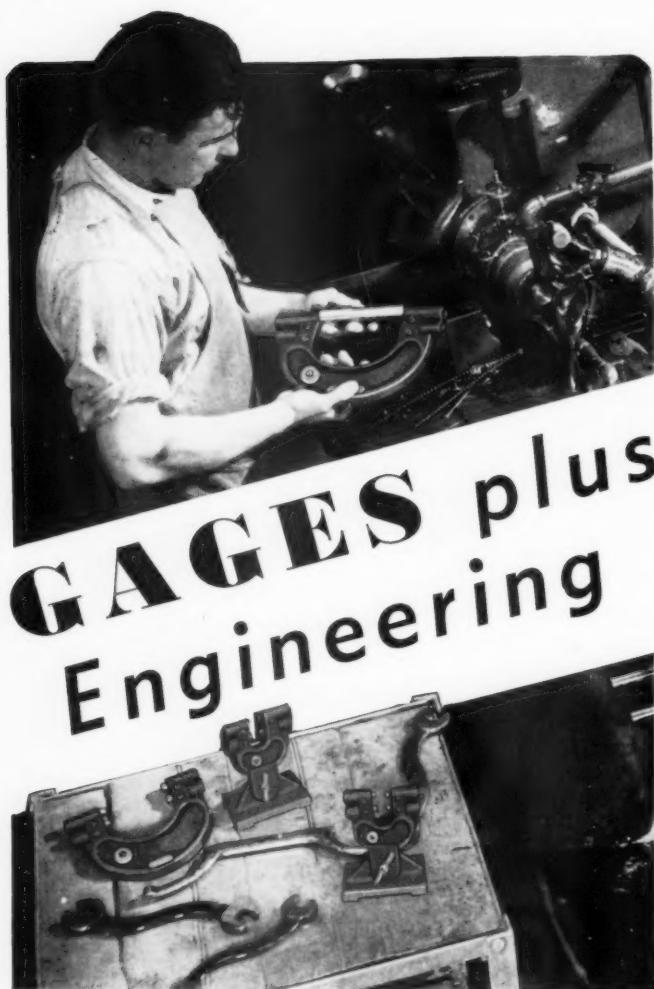
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GAGES may be less than half efficient unless they are completely adapted to the particular needs of the individual job.

The accuracy and reliability of "G.T.D. Greenfield" plug, ring and limit snap gages, is backed by an engineering department with over 50 years of experience in handling problems relating to thread cutting and gaging.

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in a frame. This combination of opposing properties is obtained through the use of a new steel, heat treated in a new manner.

The blade is coated with an all-over patented black metallic protective finish, with complete identification data, including dimensions and pitch printed in yellow on the black metallic background. This innovation makes it the first tungsten blade to be coated with an all-over protective finish in color.

MODERNIZED CONVEYING SYSTEMS

■ For a great many years many different industries have been using, to some extent, gravity roller conveyors. In the great majority of these old installations, the conveyor is permanently fastened to the floor and is hooked up with power belt conveyor and chutes.

These old types of roller conveyor were of great value and still are for handling large boxes, cartons, etc., going into weights of 750 pounds or more. They are, however, too heavy to set up and tear down as the occasion arises—in other words, they are too sluggish for loads under 750 pounds and too ponderous to move and set up quickly.

The Metzgar Company, Grand Rapids, Michigan, have developed a wheel conveyor made in 5-foot and 10-foot sections and curves that seem to be filling in this missing link very nicely. A special pressed steel wheel is used, (oilless and dust-proof). This conveyor has extraordinary strength, has no rough edges and weighs only 6.7 lbs. per foot, so that one or two men can set up a line quickly. Tripod standards, which will level themselves quickly to any type of floor, are used.



FOR ECONOMY

The "herringbone" pattern on SAFETEX Gummed Tape is embossed into the gum. This insures perfect moisture distribution from edge to edge across the width of the tape, eliminating bubbles and blisters while applying. These grooves make SAFETEX cloth-like and pliable and increase sticking speed and holding power. Result—permanent, efficient and economical sealing.

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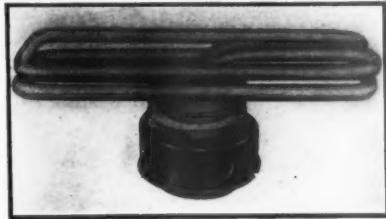


■ Well known by their ten-year service record, Series EC pillow blocks made by Ahlberg Bearing Company, Chicago, Ill., are now equipped with neoprene seals to protect the bearings and retain lubricant.

These seal rings turn with the shaft and float in the housing. They are of the effective labyrinth type, frictionless and long-wearing. Complete units consist of full self-aligning, precision ball bearings, mounted in one-piece Parkerized, accurately machined, housings. Compact and simple, the design lends itself to light and normal service where reliable yet inexpensive bearings are required.

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■ Recent developments have now made available a complete line of tubular units in diameters from $5/16$ " to $1/2$ " inclusive, and in lengths from 12 inches to 8 feet. These tubular elements are used extensively in water, oil, air and molten metal and molten salt heating; are constructed with a helical coil of nickel chromium resistance wire, imbedded in a refractory material, which is encased in a metal tube. Copper, steel and

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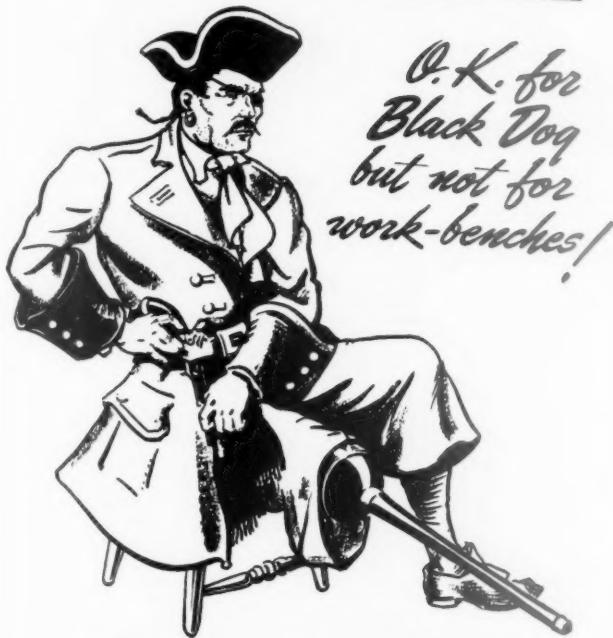
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Fig. 732

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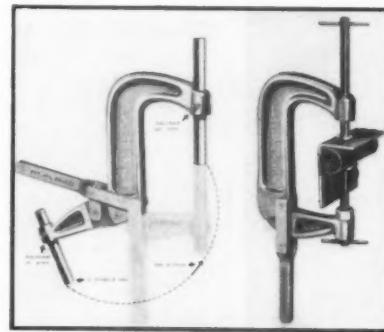
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TOGGLE ACTION CLAMP



■ **Combining** all the advantages of the old "C" clamp with swift toggle action, the portable clamp manufactured by Detroit Stamping Company, Detroit, Michigan, is so designed that it will hold together many types of work not formerly possible. It has two holding rods instead of one and when released by

toggle action, the entire lower half swings clear of the work. The operator is thus enabled to get around obstructions in fixtures, and to take in and clamp firmly such pieces as angle iron or T-shaped iron, which were formerly difficult, if not impossible, to handle.

The clamp is made in two models. One has two threaded rods which permit quick, easy adjustment. The other has two smooth rods which are set-screw adjusted, and is especially suited to arc welding work, having no threads to burn or damage.

The clamp itself is fabricated of malleable iron, the rods of steel, the toggle handles of case-hardened steel, making the whole assembly tough, and of unusual tensile strength. It is impossible to permanently damage or distort the toggle-action "C" clamps up to a pressure of one thousand pounds.



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UNIT HEATERS



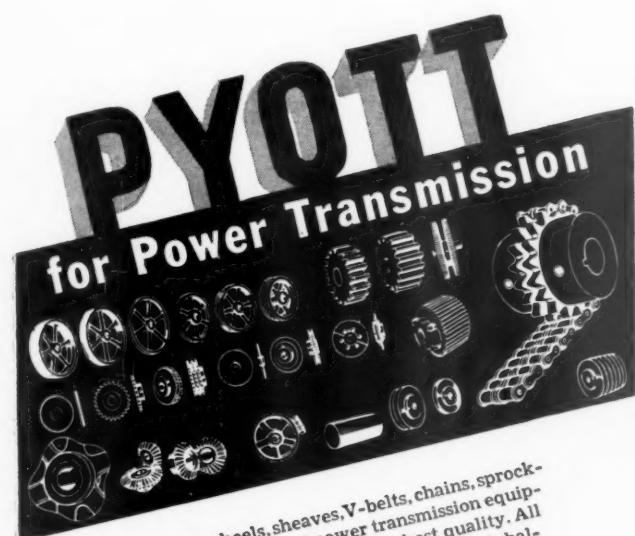
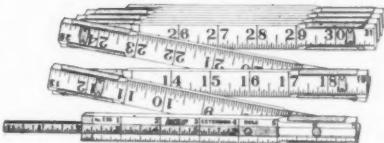
■ In a modern streamlined cabinet and streamlined non-air restricting motor supports, and die-formed fan shroud that increases air quantity and decreases noise and h.p. is contained the unit heater manufactured by D. J. Murray Mfg. Co., Wausau, Wis. The design of the individual all copper turbo spiral fin tube core provides an even distribution of heated air at high velocity. The individual tubes prevent stresses due

to unequal expansion. The entire unit is spring suspended and floats free in the casing, thus eliminating rigid connections between the cabinet and the unit. The M Series heaters are made in 27 different models for steam capacities, and 8 models for hot water capacities.

EXTENSION RULE

■ A 6-ft. extension rule, No. X-56 is being offered by The Lufkin Rule Co., Saginaw, Mich. It is a companion to their very popular No. X-46, but lower in price.

It is of the same weight as an ordinary spring joint rule, except for the heavier end section which carries the brass slide. It is equipped throughout with



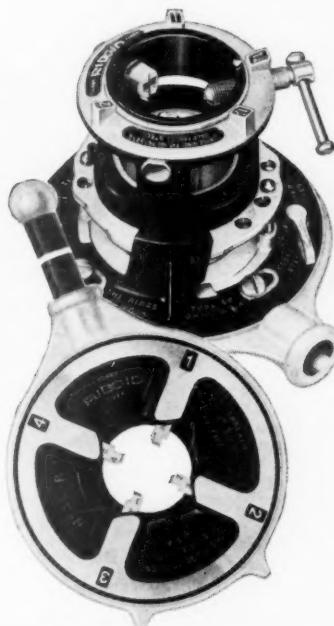
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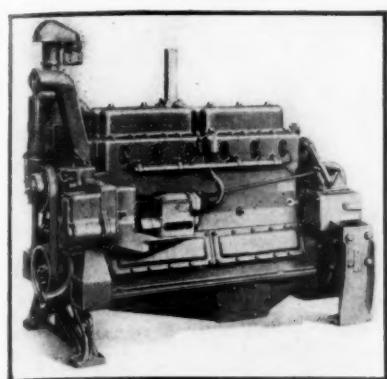
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NATURAL GAS ENGINES



■ Three models of heavy-duty natural gas engines have been announced by Caterpillar Tractor Co. of Peoria, Illinois.

The engines are built in two cylinder sizes. The Model 4600G is a six cylinder unit and the 4400G is a four. Both of these engines have a bore of $4\frac{3}{4}$ " and a $5\frac{1}{2}$ " stroke and they develop 74 and 48 horsepower respectively at 1600 maximum governed rpm.

A small four, the Model 3400G with a bore and stroke of $3\frac{3}{4}$ " x 5" develops 34 horsepower at 1650 rpm.

The three valve-in-head engines are designed for heavy-duty work with a minimum of maintenance. Heat resistant alloy valve seat inserts are provided on all models. The engines have superfinished crankshafts with "Hi-Electro" hardened journals. Main bearing surface on the 4600G is 118 sq. in.; on the 4400G, 89.5 sq. in.; and on the 3400G, 80.3 sq. in.

The lubricating system provides efficient filtering and full pressure lubrication to all working engine parts. In addition there is an upper-cylinder lubricator to provide extra valve lubrication for use with dry natural gas fuel.

A combination gas-gasoline carburetor is standard equipment, and though the engine will satisfactorily burn gasoline for short periods such as for starting purposes when gas is not available, the fuel system is set for the most efficient combustion of natural gas.

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FIG. 16
One of many sizes and styles of 2-wheel trucks.

FIG. 456
Steel Frame Bar Handle Truck. Cap. 3000-4000 lbs. Roller bearings, rubber tired wheels.

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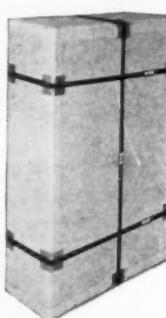
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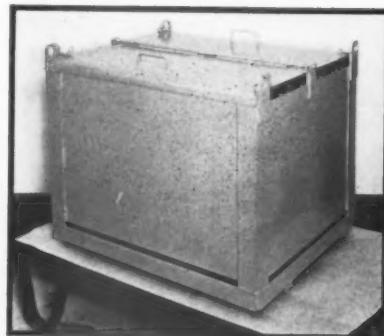
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This demountable steel compartment for industrial truck batteries has been developed by Edison Storage Battery Division of Thomas A. Edison, Incorporated. It permits quick exchange of entire unit, including battery, and provides secure attachment to truck. Use of demountable compartments is growing due to increased number of industrial trucks operating 16 to 24 hours a day.

EVAPORATIVE CONDENSER

A low cost, packaged evaporative condenser in five sizes ranging from 1½ to 32 tons capacity has been announced by E. T. Murphy, vice-president in charge of marketing, Carrier Corporation, Syracuse, New York.

Mr. Murphy stressed the rust and corrosion protection and other features of the new unit as "the latest and most outstanding development in evaporative condensers."

"The new evaporative condenser has three unique features," he explained. "They are: Elimination of spray pump and nozzles, easily removable and cleanable eliminators, and 'Micromet' water treatment in standard equipment for corrosion and scale prevention."

Totally enclosed in a rustproof "tapestry" enameled casing are the essential parts such as the centrifugal fans, finned condensing and sub-cooling coils, liquid receiver, liquid strainer, internal refrigerant, piping and other essential parts.



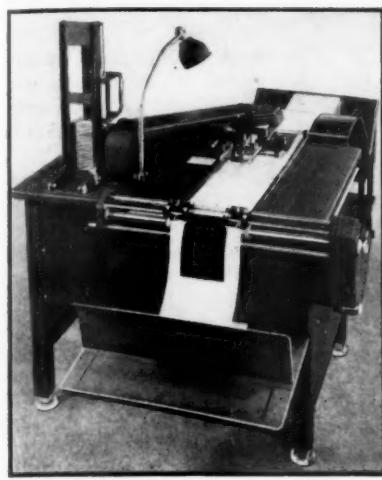
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AUTOMATIC FEEDING ATTACHMENT



■ An attachment for automatically feeding marginal punched continuous forms on the Class 1900 addressograph, is manufactured by The Standard Register Co., Dayton, Ohio. The attachment draws the forms directly across the addressograph table.

The flat-folded forms to be imprinted are placed in a loading tray. The strip of forms moves a predetermined distance and stops when the space to be im-

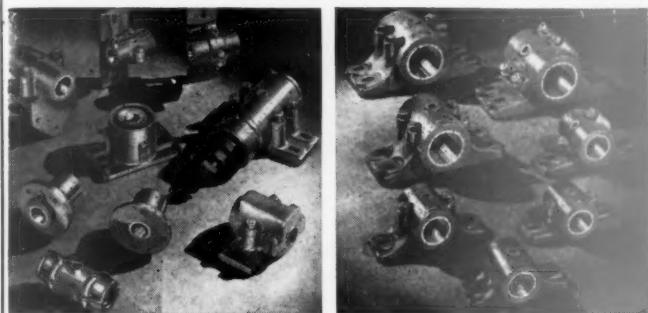
printed is correctly positioned under the impression head. After the imprint has been made, the strip of forms advances to the position of the next imprint, and so on as long as there are plates in the magazine.

The forms travel over a feed shaft upon which are mounted two pin wheels which engage the holes in the margins of the forms. These wheels are adjustable to accommodate forms up to 19 1/4 inches wide. After leaving the feed shaft, the imprinted forms are refolded in another tray.

Forms from 3 to 11 inches in length can be handled. Only one gear is changed to control the "throw" corresponding to the length of form. Adjustment for the vertical position of the imprinting area is made by means of a vernier.

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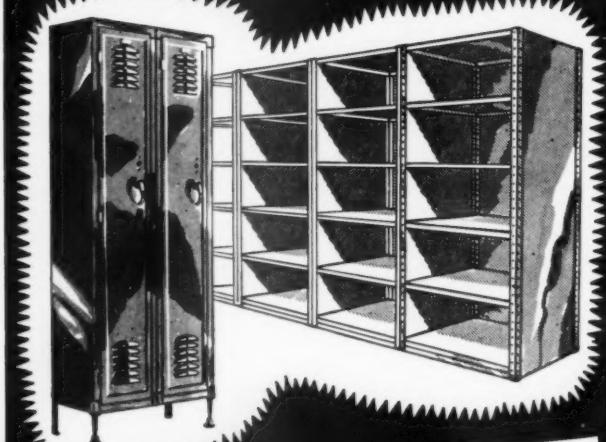
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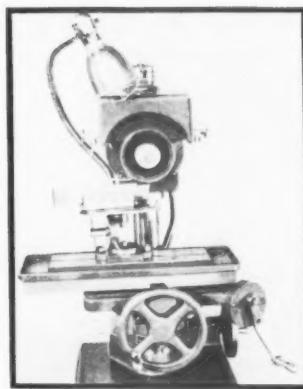
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CHIP BREAKER GRINDER



■ A low priced grinder for grinding chip-breakers in carbide tools has been announced by Carboloy Co., Inc., Detroit, Mich., to meet the chip-breaking problem occasioned by the rapidly spreading use of cemented carbides for steel cutting.

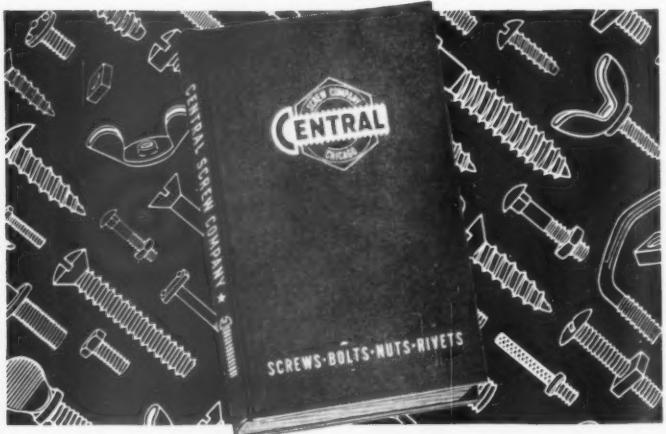
With this grinder, exact forms of chip-breakers determined as ideal for any given operation can be quickly duplicated when the tool is re-ground. For this purpose the tool is clamped in a tool holder mounted on a universally adjustable fixture table fitted with three protractors, to permit adjusting to correct setting in all directions.

The tool is then moved under the wheel to a distance corresponding to the chip-breaker width desired and the wheel is fed down while feeding the table back and forth. The wheel-feed is also provided with graduations so that chip-breakers can be ground to the exact depth desired.

BLAST COILS

■ A new development in blast coils for heating is announced by D. J. Murray Mfg. Co., Wausau, Wisconsin. As illustrated here the blast coils are open design so that nothing in the air such as dust, fumes, etc. can retard their operation. In their construction there are no tortuous air passages. They are made to permit freedom of expansion with com-

HOW THIS BOOK CAN HELP YOU



★ More than a catalog . . . this valuable reference book should be in the hands of every plant executive who specifies or purchases Screws—Bolts—Nuts—Rivets, either standards from stock or specials to order.

We say *more than a catalog*, because this book contains, in addition to complete technical and pricing data on standard Screws—Bolts—Nuts and Rivets, hundreds of true-to-product illustrations of special products. These "Special" items tell at a glance, the scope of the "cold-upset" and "rolled-thread" process by which Central can produce parts to simplify your assembly operations. Learn what is available. HOW TO GET IT FREE . . . It's easy . . . just write . . . your initials on your letterhead will do. No obligation. No cost. Your copy is waiting. Send for it today.

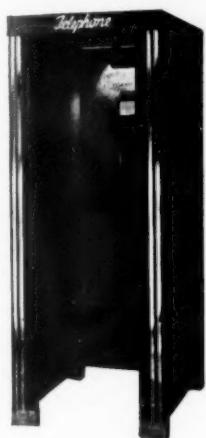
CENTRAL SCREW COMPANY

3515 Shields Avenue

Chicago, Illinois

plete absence of ruptures, strains and warping. They are compactly built, to occupy minimum space. Materials of construction make the heating surfaces immune to corrosion or atmospheric contamination due to sulphur, sulphides and other products of combustion. Moisture has no effect on the heating surfaces, and there is no loss of efficiency from formation of oxides or other elements that are usually prevalent. No electrolysis can develop as the supply and return line and the steam chamber are of one type metal. In each heating section aluminum and high test alloy iron are cast integral in the casting process, as one piece. They are guaranteed for steam pressures up to 250 pounds.

ACOUSTICAL TELEPHONE BOOTHS



■ Two acoustical telephone booths, especially adapted for use in hotels, banks, stores, and other public telephone installations, have been added to the line of booths offered by Burgess Battery Company, Chicago.

These models have no doors, yet they give complete quiet and privacy. The walls and ceiling of the booth are designed like modern auditoriums and radio stations—they are acoustically lined to blot up stray noise and create a remarkable "zone of quiet" within the booth.

They are convenient to use, because there are no complicated folding doors to cause interference, and ample room is provided inside the booth. The doorless construction allows better ventilation than is possible in ordinary, enclosed booths. Maintenance is practically eliminated, because there are no locks, hinges, or fans to give trouble.

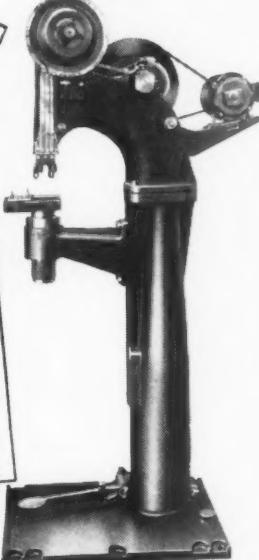
The booth illustrated, is wrinkle-finished and trimmed in chromium stripes. It presents a streamlined appearance

For SPEED CHICAGO MULTIPLE RIVET SETTERS

TODAY speed counts... speed that gets rush orders out on time... speed that keeps a plant operating at top efficiency.

A sure way to step up assembly output is to use Chicago Rivets and automatic multiple rivet setting machines. Set up to four rivets at a single machine stroke... and set them cleanly and firmly without harming the finish. You will save money too, for Chicago PRECISION RIVETS and machines are industry's most economical combination.

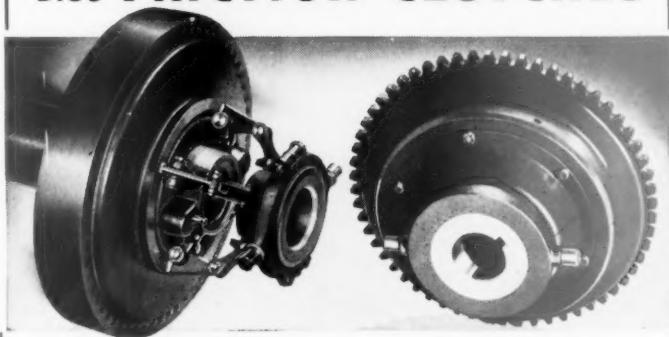
Send a sketch or blueprint or, better yet, a sample assembly, for thorough production analysis. Let us show you all the facts about multiple rivet-setting.



Chicago RIVET AND MACHINE CO.
1851 South 54th Ave. (Cicero) Chicago, Ill.

TUBULAR AND SPLIT RIVETS IN ALL RIVET METALS
AUTOMATIC AND MANUAL RIVET SETTING MACHINES

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Require Less Servicing

With Link-Belt Twin Disc Clutches, servicing is reduced to a minimum because they are engineered to fit their jobs—not merely to fit machines. That makes a lot of difference in the amount of service required—and in performance too.

Available for normal, heavy or extra heavy duty, sizes from 5 1/2" to 42" dia., rated at 1 1/2 H.P. to 350 H.P. at 100 R.P.M. Data is given in Book No. 1600 and General Catalog No. 800.

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Mione quickly removes grease, grime, stubborn stains and ground-in dirt, without injury to the most sensitive hands. Its scrubbing action is provided by two mild organic abrasives—one a carefully selected size, fine enough to scrub the finer ridges of the skin, the other providing a rapid means of removing the heaviest layers of grease and grime. Leaves the hands soft and smooth.

The cost? Approximately half a cent per person per week. Write for details of a special introductory offer and information about Mione's new quick-acting sanitary dispenser.



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ALLIGATOR
for Extra belt
lacing hours



"JUST A HAMMER TO APPLY IT"

Drives straight
Compression grip
protects belt ends
Smooth on both faces
Embeds in belt
Rocker hinge pin
Joint easily separated



15 EDITIONS and still going strong

• Here is a 72-page pocket size manual, "Short Cuts to Power Transmission," that presents a wealth of practical information about transmission and conveyor belts. Offers pointers on how to care for belts, methods of lacing, how to repair conveyor belts, etc.

WRITE FOR YOUR COPY

One of our lunch hour statisticians estimates that two hundred million belts have been laced with Alligator steel belt lacing since its introduction thirty years ago.

If these belts could all tell their story of performance it would be summed up in "extra belt lacing hours."

Since the original patent expired there have been many lacings that looked like Alligator. But fortunately for Alligator the making of belt lacing is a highly specialized job. Years of research, backed by thousands of dynamometer tests plus better alloy steels and the constant improvement in die making and stamping practice, have been responsible for these extra belt lacing hours.

Every plant should have a supply of Alligator steel belt lacing on hand. Twelve sizes for flat belts of all types up to $\frac{3}{4}$ " thick. Special lengths for wide belts. Also made in "Monel" and "Everdur." Order from your supply house.

FLEXIBLE STEEL LACING CO.
4697 Lexington St., Chicago, Ill.

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING

with rounded corners. The side and front are in one piece. The booths are available in several attractive color combinations and include shelves, electric light fixtures, and telephone mounting panels. Over-all dimensions are: height 79 $\frac{3}{4}$ "; width 31"; and depth 38". Net weight is approximately 275 lbs.

AUTOMATIC KNIFE GRINDER



■ An improved automatic knife grinder has just been added to the line by Samuel C. Rogers & Co., Buffalo, N. Y. It is made in five sizes to accommodate knives from 26" to 54" long.

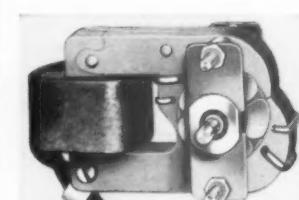
Some of the features are a heavy, well reinforced carriage bed, sturdy knife bar and increased weight which combine to provide greater accuracy and exceptionally long service in a low-priced machine.

This grinder is adapted for grinding knives edge up or down. It is equipped with a 1 $\frac{1}{2}$ h.p. motor and 10" diameter grinding wheel, providing added capacity. It is designed for grinding a variety of knives including paper, hog and wood-working knives as well as light shear blades.

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Dial Scales

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THE KRON CO.
BRIDGEPORT, CONN.

GI Type C5

Don't Be Stalled For FHP Motors

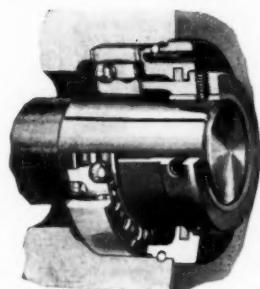
• Do you need dependable, low-cost fractional h.p. power for intermittent or steady loads in small applications? Get General Industries GI Type C5 Motors.

Test them for specified performance—service hours, peak load capacity, maintained speed. Up to 1/100 h.p.; 3,430 r.p.m. no-load speed. Shaded pole, self-starting induction type. Fan-cooled. Oil-less bearings. Speed-torque characteristics tailored to your applications. Made for all commercial A.C. voltages, 50 and 60 cycles.

Write for full details.

The GENERAL INDUSTRIES CO. Dept. 12, Elyria, Ohio

BALL BEARING UNITS



■ To provide machine manufacturers with a simple and economical means of incorporating ball bearings in their equipment where the bearing housing is an integral part of the machine, Ahlberg Bearing Company of Chicago have developed a line of bearing units known as CJB Simplex Machine Units.

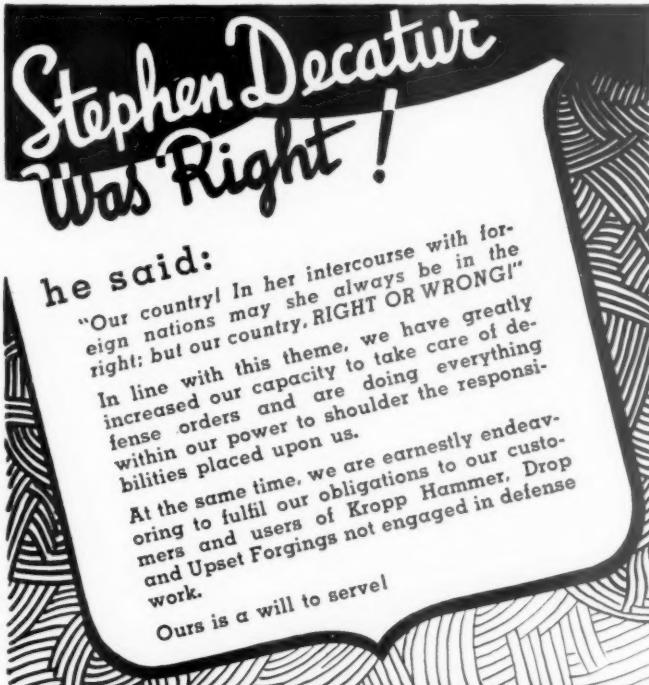
These are available in three capacities; for light, medium and heavy loads, with either

single row, double row or self-aligning bearings. In the light series the bearings are mounted directly on the shaft; whereas, the medium and heavy units mount through a split adapter sleeve in a tapered bore bearing.

Retaining caps are optional either in the open type as illustrated or the closed type, the latter sealing the bearing completely. Expansion or non-expansion units are also optional at the same cost.

ENDLESS BELTS

■ Due to the growing use of short, flat endless belts on short-center and pivoted-motor-base drives, The Manhattan Rubber Mfg. Division, Passaic, N. J., announces that Condor Whicord endless belts are now available from stock for prompt shipment in a number of sizes and in two styles. The two styles which are carried in stock are capable of handling drives from $\frac{1}{4}$ to 25 horsepower and are applicable to more than 1,500 different drives.



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LATEST DESIGNS . . . COMPLETE LINE



- Various types in a wide range of shaft sizes and bearing movements, are available from stock for light, normal or severe service; for installation in any desired position upon any suitable support. There is a Link-Belt Take-up for every service.

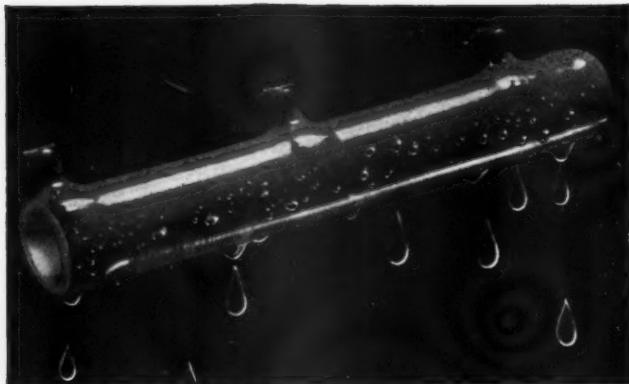
Features of design, suggestions on application, list prices and dimensions are given in Data Book No. 1600 and General Catalog No. 800.

LINK-BELT COMPANY

Chicago, Indianapolis, Philadelphia, Atlanta, San Francisco, Toronto, Dallas, Detroit, Boston, Los Angeles, Seattle, Portland, Ore. Offices, warehouses and distributors in Principal Cities 8007-A



CULLMAN WHEEL CO.
1342 Altgeld St. Chicago, Ill.



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Moisture, visible or invisible, will cause trouble if it can penetrate the protective surface of a resistor. A microscopic examination of the surface of a Ward Leonard Vitreous Enamel Resistor will show why this Resistor is able to give satisfactory service under all climatic conditions. Its freedom from even minute enamel crazes or cracks is unique. With such complete protection of the wire, moisture is effectively excluded. The Vitreous Enamel of Ward Leonard Resistors is processed at a temperature above 1400°F. Thus all elements of the enamel are perfectly fused and envelop the wire in a sealed, protective, glass-like enclosure. Send for bulletins.

WARD LEONARD
50 SOUTH STREET MOUNT VERNON, N. Y.

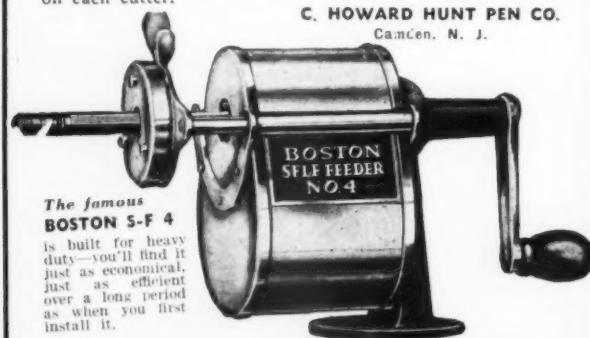
ELECTRIC CONTROL DEVICES SINCE 1892

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demands the Best!
BOSTON SELF FEEDER
NO. 4 IS THE ANSWER!

You know how America hates something "almost the best." America just won't buy "almosts." That's why Bostons are specified in orders given for pencil sharpeners for plant efficiency.

Your job depends on elimination of waste in materials and money. Boston S-F 4 will give you sharp value all along the line. Boston S-F 4 always cuts long, firm, uniform points; feeds the pencil itself; stops cutting when a perfect point is made; lasts longer due to three extra cutting edges on each cutter.

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Camden, N. J.



The famous
BOSTON S-F 4
is built for heavy duty—you'll find it just as economical, just as efficient over a long period as when you first install it.

BOSTON
PENCIL SHARPENERS

VACUUM HOLDERS



■ The vacuum cup holder, or lifter, manufactured by Landon P. Smith, Inc., Irvington, N. J., is a safe, sturdy lifting device capable of holding as much weight as a strong man can lift, and its uses are practically unlimited.

The device literally puts a handle on all kinds of glass as well as marble, granite and various smooth-surfaced

articles whose weight normally makes lifting, pushing, raising, lowering or carrying awkward and difficult. It is being used in many refrigerator and range showrooms, and some automobile companies are known to be using the larger models for lifting solid steel tops onto the bodies. These holders are also highly effective in handling wallboard and numerous other materials on which the strong vacuum cup can get a grip.

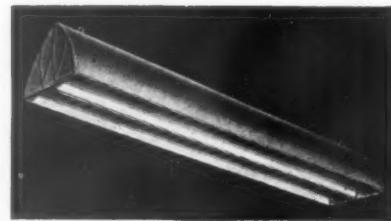
The holders come in three models with chromium-finished body and 5/16-inch thick base of tough, durable rubber. The amply sized swivel handle with rubber grip is designed for easy carrying in any position.

FLUORESCENT LAMP CONTROLS

■ An entirely new and complete series of controls (or auxiliaries) for use with all sizes of fluorescent lamps are being manufactured by the Wiremold Company, Hartford, Conn.

The line will include a complete series of controls with a power factor of 90% or more for both single lamp operation and two lamp split-phase operation. It will also include low power factor units for use where conditions require this type.

An important and unique feature is the development of two-lamp controls so compact in size that they will fit within their fluorescent lighting channel, making an extremely compact and simple installation. These two-lamp controls have high power factor, reduced stroboscopic effect and built-in compensator.



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ALL PURPOSE GAS MASK



■ Designed for protection of industrial workers and also of firemen, this mask, manufactured by Acme Protection Equipment Company, Pittsburgh, Pa., is described as combining all the advantages hitherto afforded by such a mask, with much more effective protection against smokes, fumes, and mists.

To all gas mask users who desire protection against smokes the manufacturer offers to send postpaid, a canister smoke tester through which the smoke-filtering ability of any canister can be visibly demonstrated in less than a minute. Such a test, it is agreed, reveals only one fact about any mask—that it does or does not protect against smoke.

Among the merits of the new mask as described are full vision for the user, protection against carbon monoxide and other gases equal to that of any mask in similar use, a long effective life, and a harmless chemical reaction that gives warning by odor as soon as protection against carbon monoxide commences to weaken.

ELECTRIC STOP-WATCH

■ Ever since Michael Faraday noticed the twitch of a galvanometer needle when he moved an iron magnet inside a coil of wire, electricity has been made to tackle new jobs, bridging the gap between the electrical research laboratory and practical industry.

This time science puts the principle of the electric clock to work in revamping the old-time stopwatch, and the result is a new electric stopwatch. It is run by a synchronous electric motor whose speed is precisely controlled by the power house master clock which governs the cycle constancy of alternating current. That's exactly the principle of the millions of dependable electric clocks now in widespread use.

The new electric stopwatch can't be carried about in the pocket, but can be put to work wherever it can be plugged into a 110 volt a.c. line. Made by Precision Scientific Co., Chicago, Ill.



Quick Service

LINK-BELT SPROCKETS

★ 25,000 ALWAYS IN STOCK—CUT OR CAST-TOOTH *



• Every Link-Belt sprocket is carefully fitted to the chain. This final step in the highly-developed Link-Belt process of sprocket manufacture eliminates the "break-in" period—a period of accelerated wear on the chain, as well—yet it costs you nothing extra.

Get them right from stock—bored and key-seated to your order, ready to install. We also can give you quick and efficient service on cut and cast tooth gears.



LINK-BELT COMPANY, Chicago, Indianapolis, Philadelphia, Atlanta, Dallas, San Francisco, Detroit, Boston, Los Angeles, Seattle, Portland, Ore., Toronto. Other offices and distributors in principal cities. 5282

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Spur • Bevel • Mitre and Worm Gears

Worms and Racks • All Materials

Silent Gears of Steel, Rawhide or Bakelite

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A Red Buoy to Starboard



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must hold the craft he is steering.
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channels if each of the office and fac-
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by producing it on an identifying
shade of

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STANDARDIZE ON
A-S-E MODERN LOCKERS**

As production expands . . . as more and more men are added . . . locker facilities are being taxed to the utmost. For your new and modernized locker programs, make sure your lockers fulfill every requirement. Install A-S-E Lockers—there is a type for every need . . . durable, with the stamina that modern industrial use demands—yet attractive in appearance. And maintenance costs which are so frequently encountered with less sturdy constructed lockers are eliminated with these modern A-S-E Lockers. Mail the coupon below for all the facts—no obligation.



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AID TO MOUNTING PRODUCTION**

A-S-E Shop Equipment is helping to increase the pace of business activity. Small parts are handled and stored easily and quickly with this well-designed and well-made equipment. Send for the folder describing the time-saving advantages of A-S-E Stacking Boxes, Stack-Units, Steel Boxes, Taper Pans, etc. There is no obligation.



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F.O.B. *filosofy of buying*

SALES MEN who writhe at the very idea of restricted calling hours in the purchasing department may find even more potent cause for teeth-grinding in a recent pronouncement by the world's biggest customer: "If you're thinking of coming to Washington in search of defense orders—don't do it; you'll do better to write a letter." The Commerce Department, friend of the business man and dedicated to his services, has established a guide service for the hopeful sales emissaries, who come to Washington at the rate of a thousand a day and spend most of their time getting referred from one office to another. According to these guides, says a newspaper report of the situation, there are approximately 500 major and 2,300 minor officials who have something to do with governmental buying, and although the purchasing job is generally coordinated, the average manufacturer needs to tell his story to six or more buyers in order to reach the one he wants. An example is cited of a saw manufacturer who asked to be put in contact with the right person, and was handed a list of sixteen people to see, in as many different offices. Consequently they urge: "Put it in writing."

opened on delivery a skunk waddled out upon the platform. Two of his brothers, deceased, were found inside. The purchaser contended that skunks, live or dead, certainly came within the ruling against foreign material in grain, and put in a claim. The salesman was loath to admit the point, but when it became apparent that argument wasn't going to settle the matter, he wired his principals in Chicago for instructions, demanding to know who, under these circumstances, owned the grain. The answer was brief and to the point: "The skunks, undoubtedly."

Statistics reveal that Purchasing Agents are buying further ahead—three months, six months, nine months. That isn't hard to understand. Deliveries being what they are today, anyone who places an order is buying six months ahead.

**Gleaned from the New York
Purchasing-Sales Meeting**

The difference between an acute shortage and a troublesome surplus may be as little as 10%.

The ideal industrial salesman for 1941 is the one who will cheerfully accept an order.

The ideal Purchasing Agent for 1941 is the one who buys the least and accepts the longest delivery.

All other factors being equal, personality is what lands the order. Personalities are never exactly equal.

The salesman who starts off with the remark, "I used to be a Purchasing Agent myself," may not strengthen his case, but is likely to arouse sympathy.

Professional standards in law are generally not so high as in medicine; professional standards in teaching are generally not so high

as in law; professional standards in purchasing and selling—are just what Purchasing Agents and salesmen make them.

One reason why price information should be regarded as strictly confidential is the Federal Trade Commission.

It's getting so that you can't walk down a corridor in Washington without bumping into someone high in the ranks of purchasing men. F.O.B. lunched there last week with two past presidents of N.A.P.A., and by the time this is published it is likely that two more, and possibly three, will be working at the Capital. Shipman medals are as thick as the D.S.O. And incidentally, it's about the best thing that has happened thus far in the National Defense purchasing job.

WE are indebted to a column entitled "For Horoscope Fans" in the February 10th issue of the *Baltimore Evening Sun* for this enlightening information: "If February 11 is your birthday . . . as a Purchasing Agent . . . both fame and fortune may be yours." (Other suggested occupations for this birthday date include columnist, author, designer, artist, inventor, clergyman, salesman, business executive, chemist, financier, builder, agriculturalist, or jurist.) "The best hours for you on this date are from 10:30 A.M. to 12:30 P.M., from 1:30 to 3:30 P.M., and from 8:30 to 10:30 P.M. The danger periods are from 8:30 to 10:30 A.M., from 6:30 to 8:30 P.M., and from 10:30 P.M. to midnight." (We have not checked this schedule with salesmen's calling hours.) "While it is all right to have confidence in your own judgment, you must not feel hurt if other people sometimes question it." (Well, that has happened to most P.A.'s, one time or another.) "Being 'penny wise and pound foolish' may be one of your failings, and it will be a mistake to ignore it when you realize it is a weakness that needs correction." (Oh-oh!) And finally, refuting Elbert Hubbard's famous definition that denies a sense of humor to the purchasing man, is this sage advice: "Do not let your sense of humor interfere with your abundant supply of tact." (Oh well, we weren't born in February anyhow.)

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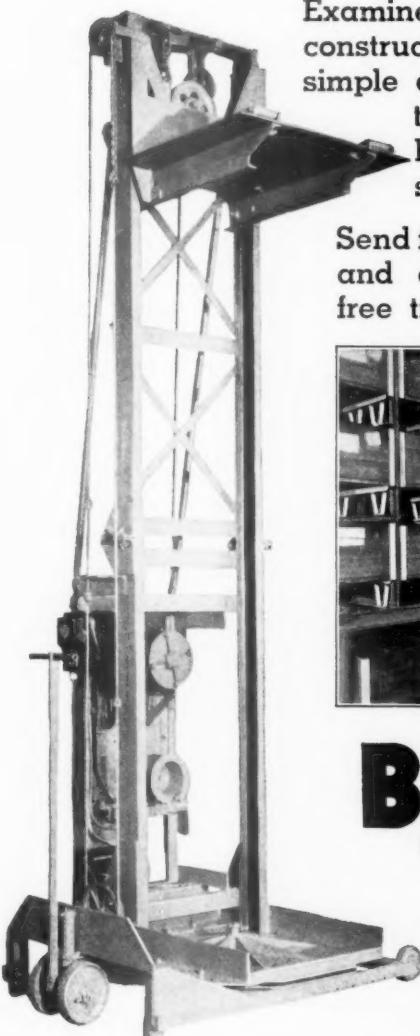
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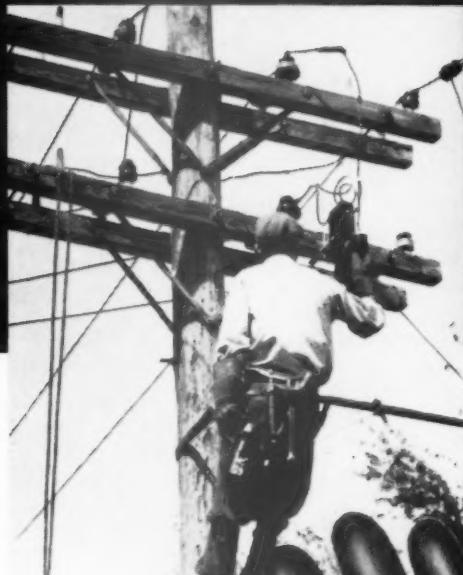
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